THE JOURNAL
of the American Medical Association
Published Under the Auspices of the Board of Trustees
VOL. 161, NO. 14 CHICAGO, ILLINOIS AUGUST 4, 1956
COPYRIGHT, 1956, BY AMERICAN MEDICAL ASSOCIATION

ACUTE, SUBACUTE, AND CHRONIC SUBDURAL HEMATOMA

Francis A. Echlin, M.D., Sabato V. R. Sordillo, M.D.
and
Thomas Q. Garvey Jr., M.D., New York

• *Subdural hematomas were found at operation in 300 patients out of 30,000 hospitalized for recent head injuries. Diagnosis was difficult, since abnormal neurological signs were frequently not of localizing value. Marked dilation of the pupil on one side was associated with ipsilateral lesions in 35 cases, contralateral in 9, and bilateral in 12.*

The prognosis was related to the degree of traumatic brain injury and to the timing of operation. Operation to save life must usually be done before the appearance of coma.

Patients in whom operation became necessary during the first seven days were classified as having acute subdural hematomas; of the 93 patients in this group, 67 died. There was a subacute group in which operation was done on the 7th to 22nd day; of 132 patients in this group, 31 died. Of 75 patients in the chronic group, in whom operation was done later than 21 days after the trauma, 19 died.

Progressive, often fluctuating, stupor, developing gradually after a lucid interval, is characteristic of hematoma. Operation relieves the symptoms of the hematoma but not those caused by irreversible damage to the brain itself. It is important to recognize the existence of the subacute group, since patients in this group required surgery to save life on the 7th to 21st day after injury.

This article deals with the diagnosis and treatment of 300 cases of subdural hematoma in which operation was done in a series of 30,000 head injuries. In the time of Virchow, chronic subdural hematomas were included under the term pachymeningitis hemorrhagica interna. After the classic paper on chronic subdural hematoma by Trotter[1] and the important contribution by Putnam and Cushing,[2] the traumatic nature of this condition was established. Many outstanding articles have since been devoted to its description, especially by members of neurosurgical clinics. Much less attention has been paid to acute lesions, seen chiefly by physicians in big city hospitals, and opinions as to what constitutes an "acute" subdural hematoma have varied widely.[3] With time, custom has dictated that all subdural hematomas be divided into acute and chronic groups, despite advice to the contrary by Laudig, Browder, and Watson[3c] and Munro.[3b]

In the present study of cases on a large emergency service, it has been apparent that a classification of subdural hematomas into acute and chronic groups is misleading and fails to recognize or to alert the medical profession to the fact that almost half of all these cases are really subacute and require operation as a lifesaving procedure on the 7th to 21st day after injury.[4] In this paper, therefore, subdural hematomas have been divided into acute, subacute, and chronic groups (see table), although it must be clearly recognized that there is no sharp dividing line between the three forms.

In the group of acute subdural hematoma are included all patients with a subdural hematoma who appear to require surgery as a lifesaving procedure during the first week after injury. The majority of these individuals have sustained a severe head trauma, resulting in fresh blood or blood clot in the subdural space and a seriously injured brain (fig. 1). Due to severe brain injury, the mortality in the acute group is high during the first week and extremely high in the first 48 hours after injury, even though the hematoma has been removed. Patients with a chronic subdural hematoma have usually recovered from their head injury, which may have been severe but more often was mild, or there may be no history of trauma. Several weeks to months later serious symptoms appear, often presenting a diagnostic problem that may suggest brain tumor, diffuse degenerative brain pathology, or psychosis. Surgical evacuation of the hematoma, which as a rule is encapsulated, is curative in the majority of cases if the patient is not in coma at the time of operation. Between the two extremes of the condition described falls the group of subacute subdural hematoma. In this group, which includes almost 50% of all instances of hematoma in our series, the head injury is most often relatively severe. Recovery from the initial brain injury occurs, but it is very often incom-

From the Department of Neurosurgery, New York University-Bellevue Medical Center.

plete and is followed by drowsiness, disorientation, or other progressive signs of brain compression from the hematoma. Surgery becomes essential to save life at any time from one to three weeks after injury and carries a very good prognosis in the majority of cases, providing the patient has not lapsed into coma before operation.

Material

In the 300 cases of subdural hematoma described, operation was done on the wards of the neurosurgical department of the New York University–Bellevue Medical Center during 1940-1951; these cases were from among more than 30,000 patients with recent evidence of head injury admitted to the Bellevue Psychiatric Hospital and to Bellevue Hospital. Of these, approximately 6,000 patients had evidence of relatively severe intracranial injury and were sent to the neurosurgical wards. Some of the patients with more chronic hematomas were transferred from the psychiatric or medical services, having been admitted there with no history of head trauma.

Data on 300 Cases of Subdural Hematoma

	Acute		Subacute	Chronic	
Time from injury to operation	2 to 48 Hrs.	3 to 7 Days	7 to 22 Days	22 to 30 Days	Over 30 Days
Total no. of cases ..	50	43	132	20	55
Lived	5	21	101	18	38
Died	45	22	31	2	17*
Mortality, %	90	51.1	23.4	10	30.9

* 12 of these 17 patients were in coma at time of operation.

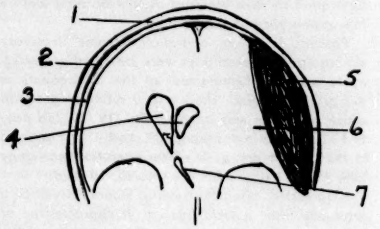


Fig. 1.—Schematic representation of subdural hematoma. 1, skull; 2, dura mater; 3, subdural space; 4, lateral ventricles displaced away from hematoma; 5, subdural hematoma in black; 6, brain compressed by hematoma; and 7, displaced third ventricle.

The above statistics indicate that an operable subdural hematoma occurs in approximately 1% of all head injuries and in about 5% of the severe cases. In addition, about 1% of the severely injured patients developed an epidural hemorrhage and 1% an intracerebral blood clot. In other words, less than 2% of all patients with head trauma in this series had an intracranial hematoma at operation, and about 7% of patients with severe head injuries developed such a surgical lesion. Undoubtedly in addition there were a number of instances of intracranial hematoma that were not diagnosed clinically. These findings on the incidence of subdural hematoma are in keeping with those of Browder and co-workers,[3c] who reported an incidence of 1% in their series, and are somewhat lower than those of Munro,[3b] who found 10% in a more selective group.

Etiological and Pathological Considerations

Brain laceration has appeared to be a common source of subdural hemorrhage, judging from the operative findings. Trauma was severe enough in 90% of the cases of acute and subacute hematoma to cause a laceration, and blood was present in the cerebrospinal fluid of about 90%, exclusive of the chronic cases. Rupture of a vein bridging the subdural space, as described by Trotter,[4] was probably the source of the bleeding, especially in cases of chronic hematoma that followed minor trauma. Massive arterial hemorrhage associated with a depressed skull fracture occurred in at least six cases from laceration of branches of the middle cerebral artery or from a torn middle meningeal vessel that bled through a rent in the dura. A few subdural hematomas resulted from a ruptured aneurysm or tumor, but these were not included.

The formation of a collection of blood in the subdural space usually gives rise to few early symptoms unless the hematoma forms rapidly or is unusually large, as in the uncommon case of active arterial or massive venous hemorrhage. The bleeding generally stops soon after injury, and evidence of continued subdural bleeding is rarely seen at operation in subacute or chronic cases. Delayed symptoms in subacute cases, therefore, in our opinion, are rarely due to slow hemorrhage, despite the occasional presence of red blood cells in the outer membrane. The fatal course of many patients with acute subdural hematoma is, as stated, generally the result of associated brain injury and its complications and not of the hematoma.

Because the brain can adjust rapidly to a large subdural clot, the patient may become asymptomatic or relatively so as he recovers from his direct brain trauma. Most hematomas then liquify, if they are not already in such a state, and become larger as they acquire more fluid, presumably through the process of osmosis.[5] It is this increase in size of the hematoma over days to months, with its resulting effect on the underlying brain, that causes progressive symptoms and death in the great majority of cases unless operation is carried out. In the chronic state the hematoma is most often liquid but may contain soft clot and usually is surrounded by a membrane at any time after the seventh day of its formation. Occasionally the clot becomes organized to the consistency of liver, and rarely it is calcified. Pathological changes in the brain as a result of pressure from the hematoma have been widely described in the literature.[6]

Acute Subdural Hematoma

Ninety-three patients operated on before the seventh day after injury have been included in the group with acute subdural hematoma. Analysis of these cases is divided into two sections to stress the high mortality that occurs in those operated on within two days of the injury.

Patients Operated on During First Forty-Eight Hours.—There were 50 patients in the group who were operated on in the first 48 hours after injury. Trauma to the head was severe or relatively so in 47. X-rays of the skull were obtained in 20 and revealed a

fracture in 14. The spinal fluid was bloody in 46, and no lumbar puncture was done on 4. Stupor or semistupor persisted from the time of injury in 45. Only two patients became sufficiently mentally clear to walk and to answer questions, but even these two were confused. Most patients showed slight improvement after the injury, but the clinical picture then deteriorated and deep stupor or coma appeared in all. The downhill course was accentuated by a convulsive seizure in 10.

Abnormal neurological findings were present in all cases, usually progressive in nature and suggestive of a focal lesion. Only 5 patients survived in this group of 50 acute cases, and 3 of these were individuals with a relatively lucid interval after injury. The subdural hematomas removed at operation in the 50 patients consisted of large, fresh, "current-jelly" clots, with varying amounts of fluid blood. An associated intracerebral clot in the temporal lobe was present in 4, and a lacerated brain was noted in at least 19 instances at operation.

The 50 patients operated on within 48 hours after injury suffered in most instances from a severe brain trauma plus an acute subdural hematoma. Death in 45 cases, a mortality of 90%, was due largely if not entirely to brain injury, the removed hematoma, although large, being incidental. Survival in five cases may be attributed to evacuation of the blood clot, the brain injury being less severe in these individuals.

Patients Operated on Three to Seven Days After Injury.—Forty-three patients are included in the group of patients operated on three to seven days after injury. Trauma was severe in the majority. Blood in the spinal fluid was obtained in 33, and in one the fluid was clear. A fractured skull was reported in 13, and the x-rays were negative for fracture in 13. Thirty-six individuals improved to the state where they were conscious but usually drowsy and disoriented, although in three instances they became alert and oriented. Thirteen patients were very restless, agitated, or violent. After these patients showed some improvement, drowsiness became progressive, often fluctuating in character, and semistupor to stupor appeared in all. A deterioration in the state of consciousness, often sudden in onset, and deterioration of other signs was hastened by an epileptic seizure in 15 patients. As in most cases of acute subdural hematoma, there were usually some neurological signs of progressive brain pathology. At operation the hematomas consisted of "current-jelly" or "milk-chocolate" clots, with varying quantities of reddish-brown to black fluid. Two patients had yellow subdural fluid. Death occurred in 22 patients, and 21 lived.

Most of the 43 patients in this group received a severe head trauma. Twenty-two died largely as a result of their brain injury, despite removal of the hematoma. The remaining 21 were saved by operation. The mortality of 51.1% is considerably lower than in those operated on in the first 48 hours, and the degree of consciousness temporarily regained shortly after injury was greater in a higher percentage of cases. The brief duration of the illness, it is believed, justifies placing these cases among the group of acute subdural hematomas.

Subacute Subdural Hematoma

In 132 patients operation was done on the 7th to the 22nd day after head injury. Trauma to the head was sufficiently severe in at least 120 cases to cause blood in the spinal fluid. A fracture of the skull was noted on the x-ray in 55, and the x-rays were normal in 38. All patients who lost consciousness after injury subsequently regained it. Thirty-nine individuals became mentally clear for varying periods, and during this interval many of them complained of headache. The remainder, although they regained consciousness and in many cases became alert and cooperative, continued to show some degree of drowsiness and disorientation. With about 20 exceptions, before operation all patients went through a period of progressive drowsiness that was usually fluctuating in nature and commonly ended in semistupor, stupor, or coma. Abnormality in the neurological examination, often slight and at times absent, but usually progressive, was present in the majority of cases. Thirteen patients had pneumoencephalograms and five patients angiograms prior to surgical exploration. The clinical course was aggravated by a convulsive seizure in 31.

Pathologically the hematomas in at least 61 of this group consisted of "current-jelly" or "milk-chocolate" clots, with black, tarry, or brown fluid in all but 9 cases, in which it was yellow. Membranes, at times bluish or bluish-green in color, were described in 27 cases, in 18 of which blood clots were also present. Of 132 patients, 101 lived and 31 died.

In this group of 132 subacute cases the mortality was 23.4%, which is much less than in the acute variety. Unlike many of the patients with acute lesions, in the patients in this group recovery from the brain injury had taken place or was occurring when the downhill course was precipitated by compression from the subdural hematoma. Improvement clinically and from the brain injury was usually less complete and less prolonged than seen in the chronic group. Pathologically, the hematoma, as regards such factors as its stage of liquifaction or membrane formation, occupied in most instances a position between the acute and chronic type. On the basis of time elapsed since the injury, clinical course, nature of the brain injury, and pathology of the hematoma, most of these cases were neither acute nor chronic and are well described as subacute.

Chronic Subdural Hematoma

All 75 cases in which operation was done later than 21 days after trauma are included in the chronic group, but for the sake of analysis they are divided into two sections according to time elapsed since injury.

Patients Operated on from Twenty-One to Thirty-One Days After Injury.—There were 20 patients in the group of patients operated on 21 to 31 days after injury, and a history of a relatively severe trauma to the head was obtained in all. The spinal fluid was bloody or xanthochromic in at least 14 cases. Eight of the patients became mentally clear, and 12 were alert but continued to show a variable degree of disorientation and memory defect. In seven patients the diagnosis of an intracranial expanding lesion was confirmed by

pneumoencephalogram and in one by angiogram. The remaining 12 patients became progressively disoriented and drowsy and were explored for a hematoma. At operation the hematoma resembled that seen in the usual chronic case, but blood clots were present in nine, and one clot was organized to the consistency of liver. Membranes were described in nine patients.

Eighteen of these individuals lived, and two died. Classification of this more or less transitional group is difficult. In keeping with most authors, we have described these cases as chronic, since operation was done more than 21 days after injury. Actually many of them would fit better into our group of subacute cases.

Patients Operated on More Than Thirty Days After Injury.—Fifty-five patients comprise the group operated on more than 30 days after injury. A definite history of injury was obtained in only 18, but most were unable to give an accurate history on admission. Spinal fluid was removed in 43 and described as bloody in 10, xanthochromic in 11, and clear in 19; the color was not noted in 3. A fracture of the skull was described by x-ray in 8, x-rays were normal in 12, and no x-rays were available in 19. The history in the great majority of patients was one of mental deterioration for weeks to months, with gradual disorientation and confusion leading commonly to fluctuating drowsiness. Headaches frequently preceded the mental changes. At times the patient was irritable and even violent. Many were admitted as psychiatric cases to Bellevue or were considered to have arteriosclerotic encephalopathy or brain tumor. Most patients had neurological signs of organic brain disease, although commonly these signs were slight or absent.

In nine patients the diagnosis was made by ventriculogram or by pneumoencephalogram and in three by angiogram. In several the hematoma was unexpectedly exposed during ventriculography or during operation for an apparent brain tumor. In the remaining patients operation was carried out because of the downhill course. All 55 patients had fluid hematomas, which were surrounded by membranes in at least 46. The fluid was of varying shades of brown, except in six cases, in which it was yellow. Some blood clot was present in 16, often in the form of a shaggy, brown clot beneath the outer membrane. Twelve patients were comatose before operation, and all of them died. Of the 55 patients, 38 lived and 17 died. The clinical picture in this group of patients with chronic subdural hematoma was most commonly one of progressive mental deterioration, frequently simulating that seen in psychosis, arteriosclerosis, or brain tumor, and often leading to progressive fluctuating drowsiness and neurological signs of organic brain disease. There was frequently no history of head injury, or the patient had recovered from such an injury before symptoms appeared.

Diagnosis

If after a head injury a patient regains consciousness and is relatively alert (has a lucid interval) and subsequently in hours to weeks becomes progressively stuporous, it is essential that an intracranial hematoma be ruled out. Such a clinical course developing in the first 24 hours is usually due to an epidural hemorrhage from the middle meningeal artery and as a rule is accompanied by hemiplegia and a dilated pupil, but occasionally a massive subdural or intracerebral hematoma will give a similar picture. These patients may be saved by emergency operation. The vast majority of the other patients operated on in the first 48 hours, who have remained stuporous from the time of the accident, are suffering from brain injury and will not be benefited by surgery even though localizing signs are present and a subdural hematoma is removed. A rare exception is the patient with an epidural or large subdural hematoma, unaccompanied by fatal brain trauma, that develops while the patient remains stuporous and is usually impossible to diagnose. After the first 48 hours following injury, the most common and characteristic symptom of a subdural hematoma is progressive drowsiness, often with disorientation and generally fluctuating in character. In the case of chronic lesions a gradual mental deterioration frequently precedes the drowsiness. The clinical picture of an intracerebral hematoma or tumefaction from local, traumatic softening may closely simulate that produced by subdural hematoma.[7]

Abnormal neurological signs, although they may be minimal or absent, are usually present and often gradually progressive. These include papilledema, which is not common during the first two weeks after injury. Frequent findings are an inequality of the pupils, less often a dilated pupil, a slight lower facial weakness, unequal deep reflexes, unequal abdominal reflexes, and the presence of Babinski's sign, often bilaterally. Progressive unilateral motor weakness, and occasionally hemiplegia, occurred as a result of a subdural hematoma in 43% of acute cases, 20% of subacute, and 42% of chronic. A slight drift of one of the outstretched arms is a frequent and very valuable sign, especially when it is increasing in severity. A convulsive seizure in any of these cases may precipitate hemiplegia. Other less frequent signs include aphasia, homonymous hemianopsia, paralysis of the third or sixth nerve, a hemisensory loss, and, in chronic cases, catatonic-like posture, tremor, and unsteady or shuffling gait. Some patients with a subdural clot do not show progressive drowsiness or mental change, at least at first, but may complain of severe headache with or without neurological signs. Papilledema or an elevated spinal fluid pressure may be the only positive diagnostic signs that this small group presents. Headache of itself is, of course, by no means indicative of an intracranial hematoma. Drowsy patients do not usually mention headache.

The diagnosis of subdural hematoma is generally not made on the basis of a single examination but on observation of the patient's clinical course. It is the increasing severity of the signs and symptoms that is important, since those present from the time of injury are usually due to laceration or contusion of the brain. In summary, it may be safely stated that if, after a head injury, a conscious patient at any time, from hours to weeks, or even months, begins to show a

progressive downhill course in mental status or in neurological signs indicative of an intracranial lesion, he must be regarded as having a subdural or other intracranial hematoma until this is ruled out.

Nonclinical Aids in Diagnosis.—Although the clinical picture provides the most valuable criteria in diagnosis, there are certain nonclinical examinations that may be of great help. These include a shift of the calcified pineal body shown on x-ray of the skull, pneumoencephalography, ventriculography, electroencephalography, and angiography. Air studies or angiography are not well tolerated by the very sick patient, and bilateral temporal (and/or other) burr holes are safer and nearly always diagnostic. Electroencephalography has not been of much help in acute cases, but in the subacute and chronic ones it has been of great assistance, especially when repeated electroencephalograms are done and reveal a progressive abnormality.

"Localizing" Signs

Abnormal neurological signs due to subdural hematoma, although indicative of an organic lesion, are frequently not of "localizing" value.[8] In 79 cases, localizing signs correctly indicated the side of the hematoma, but in 29 they pointed to cerebral lesions on the opposite side. The neurological findings in 139 were inconclusive so far as localization was concerned. There were 53 cases of bilateral subdural hematoma, and in 23 of these the neurological examination indicated a probable unilateral lesion.

Unilateral motor weakness was described in 97 cases. In 21 the weakness was on the side of the hematoma, in 53 on the opposite side, and in 23 there was either a bilateral hematoma or a hematoma on one side and a fresh laceration of the opposite hemisphere. A marked weakness of an arm or leg was present in 20 patients operated on within 48 hours of the injury and was probably due to direct brain trauma. In 11 the motor weakness developed or became worse after a convulsive seizure.

Localizing Value of an Enlarged Pupil.—An inequality in the size of the pupils, at times fluctuating in character, was noted in 145 of our cases of subdural hematoma before operation. The large pupil was on the side of the hematoma in 74 cases, on the opposite side in 41, and in 30 there was a bilateral hematoma or a hematoma on one side and a lacerated brain with a small amount of subdural blood on the other. Fifty-seven patients had a quite marked dilation of one pupil, which was on the same side as the hematoma in 36, on the other side in 9, and the hematoma was bilateral in 12. These findings indicate that a dilated pupil is of some value in localization, whereas a slight to moderate enlargement of one pupil is of no value.

Convulsive Seizures

Sixty patients had one or more convulsive seizures in the hospital before operation. Fifty-six of these were in the group of acute or subacute cases, and only four had chronic subdural hematomas. The cause of the seizures in most cases appeared to be the brain injury or hematoma, but chronic epilepsy was reported in five, and chronic alcoholism, which was very common, may have contributed in some. The high frequency of seizures in the presence of brain injury and subdural hematoma is a serious complicating factor, and seizures frequently precipitated hemiparesis or continuing stupor in an already drowsy patient.

Pulse, Cerebrospinal Fluid Pressure, and Blood Pressure

Although there is no constant relationship between pulse rate, blood pressure, cerebrospinal fluid pressure, and state of consciousness in cases of subdural hematoma,[9] there are certain observations that deserve comment. A slow pulse was present in at least one-third of the cases, and an elevated pressure was found on lumbar puncture in two-thirds. A rise in blood pressure occurred in approximately one-third and in about one-half of those who showed a rapid downhill course in the first 48 hours after injury. A high cerebrospinal fluid pressure was the rule in this latter group. Most individuals with a subacute or chronic hematoma who developed a systolic blood pressure over 170 mm. Hg had an elevated cerebrospinal fluid pressure (17 out of 18 cases in which such combined studies were done). In 14 of the 18 cases the cerebrospinal fluid pressure was over 220 and in 8 over 300 mm. H_2O. On the other hand, in subacute or chronic cases a high cerebrospinal fluid pressure was more often not associated with a rise in blood pressure.

Causes of Death

In the 300 cases in which operation was done, 117 patients died, a mortality of 39%, which is almost the same as that reported by Munro [3b] and by Browder and co-workers.[3c] Forty-five of the deaths were among the patients operated on within 48 hours of the injury and were due largely to brain trauma. Of the remaining 72 patients who died, 62 were in coma or deep stupor at the time of surgery and were helped little by removal of the hematoma. The downhill course was aggravated by a convulsive seizure in 12 and by pneumoencephalography in 2. Earlier operation could probably have saved a large number of those in the subacute group, and this certainly is true of the 19 with chronic subdural hematomas. Many of these patients were already in coma when brought to the hospital or when first seen by the neurosurgeon.

It is very evident that if a patient is allowed to become comatose or deeply stuporous before surgery his chances of survival are greatly lessened. In subacute and chronic cases, coma only too frequently is due to irreversible changes in the brain stem and elsewhere, resulting primarily from compression by the hematoma, which explains the lack of improvement after operation in many of the comatose patients.[6] Three patients died of an operative infection, one of thrombophlebitis and pulmonary embolism, and, in a number, especially in the older age group, the compressed brain failed to expand after extirpation of the lesion.

Treatment

In all cases of head injury surgery is potentially necessary. Patients with such injuries should be continuously under expert observation. Until operation becomes necessary, the patient should be treated, as in all cases of head injury, with simple common sense and conservative measures. These measures have been extensively described in the literature and include keeping the stuporous patient on his side to prevent swallowing of the tongue and aspiration of secretions; avoidance of restraints; ample airway, with oxygen, and even tracheotomy, if required; temperature kept below 102 F (38.9 C), with, if necessary, alcohol sponge baths and multiple ice bags; antibiotics; after the first 24 hours, 1,500 cc. of fluid a day, and perhaps tube feeding later; maintenance of proper electrolyte balance; anticonvulsive therapy for clinical seizures; phenobarbital and rarely paraldehyde for restlessness; catheterization or indwelling catheter as indicated;

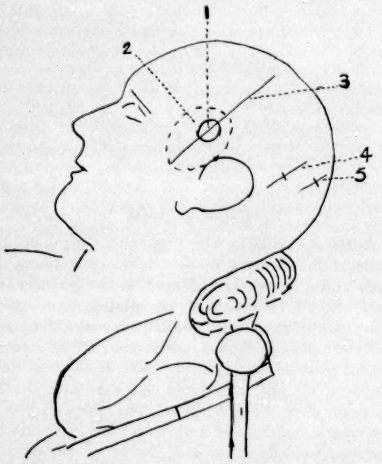


Fig. 2.—Position of patient at operation for subdural hematoma and surgical approach. 1, exploratory burr hole; 2, subtemporal decompression; 3, extended incision; and 4 and 5, additional incisions if necessary for exploratory burr hole and for ventriculography respectively.

and, finally, treatment of associated injuries. Shock was seldom observed in our patients with head injury unless there had been hemorrhage or injury elsewhere to the body. Lumbar puncture and hypertonic fluids given intravenously were rarely used in treatment, although the former was employed for diagnosis and occasionally for the relief of severe headache.

The timing of surgical intervention is extremely important. The acute cases are emergencies and may be indistinguishable from epidural or intracerebral hematomas. In the subacute and chronic group, the drowsy patient must be followed with extreme care and operated on before the appearance of coma, which in the lethargic patient often comes on suddenly. It is our custom in operating on patients suspected of having a subdural hematoma to use the subtemporal approach, with the head of the operating table elevated and the patient's head supported by a posterior neck rest (fig. 2). Both sides of the cranium are explored, as about 18% of subdural hematomas are bilateral. The head is draped so that a large subtemporal craniectomy may be done and occipital burr holes for ventriculography may be made if necessary. The great majority of subdural hematomas can be found on thorough exploration through the subtemporal approach, although additional burr holes may be made when indicated. A chronic fluid hematoma may, of course, be evacuated through an occipital burr hole when it is exposed during ventriculography. It has been necessary to turn a bone flap in only a few of the 300 cases reported, and this was usually to remove an organized liver-like clot. Certainly, in the sick patient with a subdural hematoma, a bone flap should be avoided whenever possible.[10]

Conclusions

A study of 30,000 patients with trauma to the head indicates that an operable subdural hematoma occurs in about 1% of all head injuries and in less than 5% of severe cases. The customary classification of subdural hematomas into acute and chronic groups appears unsatisfactory and misleading. If any classification of subdural hematomas is used, it is believed that it should clearly indicate the existence of a subacute group, for almost 50% of our 300 cases of hematoma were subacute and required surgery to save life on the 7th to the 21st day after injury.

164 E. 74th St. (21) (Dr. Echlin).

References

1. Trotter, W.: Chronic Subdural Haemorrhage of Traumatic Origin, and Its Relation to Pachymeningitis Haemorrhagica Interna, Brit. J. Surg. **2**: 271-291, 1914.

2. Putnam, T. J., and Cushing, H.: Chronic Subdural Hematoma: Its Pathology, Its Relation to Pachymeningitis Hemorrhagica and Its Surgical Treatment, Arch. Surg. **11**: 329-393 (Sept.) 1925.

3. Munro, D.: (*a*) Cranio-Cerebral Injuries: Their Diagnosis and Treatment, New York, Oxford University Press, 1938; (*b*) Cerebral Subdural Hematomas: A Study of 310 Verified Cases, New England J. Med. **227**: 87-95, 1942. (*c*) Laudig, G. H.; Browder, J., and Watson, B. A.: Subdural Hematoma: A Study of 143 Cases Encountered During a Five-Year Period, Ann. Surg. **113**: 170-191, 1941. (*d*) Kennedy, F., and Wortis, H.: "Acute" Subdural Hematoma and Acute Epidural Hemorrhage: A Study of 72 Cases of Hematoma and 17 Cases of Hemorrhage, Surg. Gynec. & Obst. **63**: 732-742, 1936. (*e*) Rowbotham, G. F.: Acute Injuries of the Head: Their Diagnosis, Treatment, Complications and Sequels, Baltimore, Williams & Wilkins, 1949. (*f*) Gurdjian, E. S., and Webster, J. E.: Traumatic Intracranial Hemorrhage, Am. J. Surg. **75**: 82-98, 1948. (*g*) Merritt, H. H.: A Textbook of Neurology, Philadelphia, Lea & Febiger, 1955.

4. Echlin, F.: Traumatic Subdural Hematoma—Acute, Subacute and Chronic: An Analysis of 70 Operated Cases, J. Neurosurg. **6**: 294-303, 1949.

5. Gardner, W. J.: Traumatic Subdural Hematoma, with Particular Reference to the Latent Interval, Arch. Neurol. & Psychiat. **27**: 847-858 (April) 1932.

6. Evans, J. P.: Acute Head Injury, Publication 60, American Lecture Series, Monograph in American Lectures in Surgery, Springfield, Ill., Charles C Thomas, Publisher, 1950.

7. Botterell, E. H.: Disruption of Frontal and Temporal Lobes as a Cause of Secondary Coma Following Head Injury, read before the Harvey Cushing Society, Hot Springs, Va., Nov. 14, 1947.

8. Hoen, T. I., and Panet-Raymond, J.: Contribution a l'etude des hematomas sous-duraux post traumatiques, L'Union Medicale du Canada **65**: 430-437, 1936.

9. Browder, J., and Meyers, R.: A Revaluation of the Treatment of Head Injuries, Ann. Surg. **110**: 357-375, 1939.

10. Horrax, G., and Poppen, J. L.: The Frequency, Recognition and Treatment of Chronic Subdural Hematomas, New England J. Med. **216**: 381-385, 1937.

PROGRESS IN PREVENTIVE MEDICINE

James Watt, M.D., Bethesda, Md.

• *The progress of medicine is strikingly revealed when the present is compared with the past. The life expectancy of an infant at birth in the early days of the United States was actually less than the age at which the medical student of today completes his formal education; he can afford to prolong his schooling far beyond what would once have been considered reasonable because the duration of his expected productive period has been so greatly prolonged.*

The importance of preventive medicine is appreciated only if one recalls the pestilences and similar calamities of the past. Further reduction of the mortality and morbidity from accidents is obviously possible. The prevention of such conditions as arteriosclerosis and hypertension will be more difficult.

Progress is motion toward a goal. To measure progress, we must know the goal. It is to the everlasting credit of the individual members of the medical profession that they have a goal, a goal that recognizes that human illness is not the punishment of an angry god for improper behavior, but rather a failure on the part of man to understand the interplay of forces in his environment and in his own body. The physician's goal recognizes, too, that there is an obligation to correct this failure. Some of the early beginnings of preventive medicine are spelled out in Mosaic law. Tribal customs are an interesting mixture of sound conclusions based on intelligently analyzed observations and of other conclusions that are generalizations originating in one case and remind one of those of a young child becoming acquainted with the world around him and generalizing with naïve bravery.

It can safely be stated that we in medicine still have such a mixture of conclusions. Patient, careful observations, checked and rechecked, have sorted out the obvious, and a remarkably large portion of the obscure, fallacies in our reasoning. There have been enough changes in our concepts of disease during the medical life of all physicians alive today to make us very sure that the expression we used to hear after the first act of the circus, "Sit still, folks, this may look good to you, but you ain't seen nothing yet," is pertinent to medicine today.

A famous physician-writer in the last century left us a poem that shows us a way to look at this goal of medicine. Dr. Oliver Wendell Holmes, a man who played an important role in preventive medicine in his time with his work on the prevention of puerperal sepsis, wrote about a remarkable vehicle, a famous one-horse shay. Here is a brief excerpt from that poem:

> Now in the building of chaises, I tell you what,
> There is always *somewhere* a weakest spot,
> In hub, tire, felloe, in spring or thill,
> In panel, or crossbar, or floor, or sill,
> In screw, bolt, thoroughbrace,—lurking still,
> Find it somewhere you must and will,—
> Above or below, or within or without,—
> And that's the reason, beyond a doubt,
> That a chaise *breaks down*, but doesn't *wear out!*

It seems to me that Dr. Holmes not only saw a goal clearly but also showed in the rest of his poem that he was convinced that this goal could be reached. His deacon built a shay that did not break down. Only after 100 years to the day did it wear out.

If we take literally his goal of 100 years, he must have been a man of tremendous vision. At the time he wrote, the average life expectancy at birth was much less than half way to the goal. However, he was not a soothsayer or visionary. Then, as now, there was evidence that the human body is able to function well and effectively for 100 years in the few persons who have no "weakest spot." Today, we do not need nearly as much vision to see such a goal, and the evidence at hand is partially illustrated by the fact that in the United States we are well past the midfield marker. At midcentury the expectation of life at birth was 68+ years. In fact, in football terminology, we are in scoring territory on the enemy's 32-yd. line.

Past Gains

I would like to push this comparison with a football game a little further to show some of the plays that have been made. When the forerunners of modern medicine got the ball, they were backed close to the 20-yd. line in their own territory. Think for a moment what this meant to the maximum possible productivity of the human race. The period of dependency, the period of being a drain on society, exceeded the productive years in the life span of the average person. Mankind literally could not afford to devote the number of years to training that we now accept as a minimum standard for our children. The formal training of a physician, with rare exceptions, requires so many years that the man or woman graduating from school and beginning his productive work today is several years beyond the average life expectancy of an infant in the early days of the United States. Just as when, in the game of football, we get out of enemy territory, we can stage a more diversified offensive, so in medicine this increase in life expectancy gives us the opportunity for a more powerful offensive drive. Many of our specialists can and do devote 30 to 35 years to formal training, with the realization that they can reliably count on a greater number of productive years, both relatively and absolutely, than was possible at any other time in the course of history.

People as a whole forget the triumphs of prevention since nothing remains to remind them of the past problems. Diseases that have been surmounted have

Director, National Heart Institute, National Institutes of Health, U. S. Public Health Service, Department of Health, Education, and Welfare.

Read in the Symposium on Progress in Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

been forgotten and the diseases yet to be conquered are foremost in the public's mind. But we physicians ourselves should never forget. Moreover, we have a responsibility as physicians to point out that our entire economy and our achievement in the physical and social sciences are all possible only because people live long enough to acquire the know-how we are so proud of. Even more importantly, we no longer have the pestilences and plague that literally threatened the existence of whole countries. People can now live long enough to use the skills that the advance in human knowledge makes possible.

Few, if any, of us have had to deal with plague in the form that in one week resulted in 4,237 deaths in a community in which there were only 171 births in the same week. Nor have we had to cope with outbreaks of yellow fever that decimate cities and force evacuation of populous areas, nor with cholera and similar pestilences. These diseases still exist; they are a threat, but we have the knowledge and tools with which to handle them. As we look at conditions in the world as a whole, a mopping-up process remains. It can be done and is being done.

Let me mention just a few facts to emphasize the progress we are seeing in our own time. While literally thousands of cases of malaria were seen each year in my home state when I was a child, today there are virtually none. If the diphtheria mortality rate of 1900 prevailed today, there would be over 60,000 deaths a year. In 1950 there were actually 410. According to rates of 1900, there should now be over 45,000 deaths from typhoid; actually in 1950 there were 114.

Similar figures could be given for other major communicable diseases, but it is even more interesting to mention another kind of triumph of preventive medicine: its contribution to the industry of our country. By way of illustration, I need merely cite the work on botulism, so ably done by Dr. Karl F. Meyer and others, that proved of far-reaching importance to the canning industry. From this kind of work in the prevention of illness, not only industry but the entire economy and the health of our people benefited tremendously.

Practicing Physician and Prevention

In disease prevention, the truly indispensable keystone of all medical practice in the United States is the practicing physician, wherever he be, whether in a specialty or in general practice. This recognition has been given often but in my opinion always can bear stressing. In the conquests of disease, the practicing physician is the man who deals directly with the people. He is the man who is personally responsible more than any other for daily guidance of others toward health through preventive measures. No other has or could have his opportunities for promotion of sound health education. As he will always be, the physician has been the mainstay of the important aspects of education in preventive medicine.

Present Goals

We are concerned, and rightly so, because today diseases of the heart and circulation cause over half the deaths in the United States and because cancer and other chronic illnesses are leading causes of mortality. However, in a sense this, too, marks a triumph of preventive medicine; not many years ago, a famous leader in preventive medicine set, as a goal for health, the idea of a country in which heart disease and cancer were the first and second causes of death. This particular yard marker we have reached. This fact serves only to make us push harder against remaining obstacles. Thus do goals change with progress.

One major point must be stressed: we are making progress. In cardiovascular-renal diseases there has been a general downward trend over the years. The trend is slow and due to ill-defined forces, but it is real. The only group of our population that does not appear to share in the generally favorable trend are the white males between 45 and 65 years of age. In this group, the over-all downward trend is followed only because the rates for women are lower.

The way to move ahead is clearly shown in two areas. Arteriosclerosis no longer can be classed as an inevitable part of the aging process. Hypertension at last is giving ground to therapy, and in the years 1950 to 1954 there has even been a slight downward trend in mortality from this condition. More important is the fact that new therapeutic measures are in turn research tools that will lead to understanding, at least in part, of the mechanisms that go awry and lead to hypertension.

In conclusion, I want to return to our one-horse shay, one that Dr. Holmes may have been thinking about: man as a species. There is, in research, in public health, and in other areas, a primary responsibility to find the weak spots and repair them. Dr. Holmes passed lightly over a step that, to my mind, is fundamental to the full and complete life, free of breakdowns. He made no mention of maintenance. Here, though, is the key. The individual physician and the individual patient must devote appropriate attention through the years to the maintenance of health. Personalized attention, the sense of humanity that is part and parcel of our medical system and medical practice, remains the basic force that will take us to the goal we all seek.

8000 Wisconsin Ave.

Overlooked Malignancy in Gallbladder Disease.—Persisting distress in the immediate postcholecystectomy period is occasionally traceable to malignancy overlooked when the gallbladder was removed. Cancers arising from the head of the pancreas, the duodenum, the ampullary area, or the bile ducts are not infrequently associated with cholelithiasis. Sometimes, when the growth is small, or when the duct is not probed and is examined only manually, a tumor encroaching upon the duct and narrowing its lumen is overlooked. An occasional patient may secure temporary relief from cholecystectomy, especially if there were associated stones in the common duct and these were removed at the same time. These individuals, however, soon present symptoms that were noted prior to cholecystectomy. In addition, jaundice commonly develops, if it was not already present, and constitutional alterations such as weight loss appear. An important lead is the occurrence postoperatively of acholic stools and persistent external drainage of bile.—J. E. Berk, M.D., and L. C. Alexander, M.D., The Evaluation of Symptoms Following Cholecystectomy, *The Medical Clinics of North America*, March, 1956.

PREVENTIVE ASPECT OF ROLE OF MEDICINE IN INDUSTRY

James H. Sterner, M.D., Rochester, N. Y.

• *The need for a program of practical preventive medicine, with the increasing industrialization of our society, presents a challenge and an opportunity to the physician. Extension of the role of the physician and constructive changes in the method of payment for his services will involve many physicians in private practice as preventive medical care is provided for smaller industrial plants.*

Improved working conditions have increased the life span of people in industry so that it now equals that of the general population. Personal illness and injury causes 60 or more times absenteeism than is due to direct occupational causes. The cost of workmen's compensation and of employee benefits, such as sickness allowance and hospital and medical insurance, gives industry a direct and vital interest in medical care.

The preplacement examination is the first element of a program of preventive medicine in industry; the program may also include periodic examinations of executives, advice on chemical and physical hazards on the job, counseling on nutrition and sanitation, programs of health education, and advice about air and water pollution. Within industry an opportunity is offered for the medical profession to take a leading role in a most promising application of preventive medicine.

There is a greater opportunity for developing an effective program of preventive medicine in industry, I believe, than in any other aspect of our society. To meet this challenge, to retain and justify our right to leadership in health matters, we must develop an understanding of the need and a willingness to make constructive adaptations of the traditional modes of medical practice. We must extend, with imagination and courage, the concept of the role of the physician. This discussion will emphasize the changes that are occurring, which offer a broader opportunity to the physician in private practice to participate more effectively in a program of preventive medicine, under circumstances which can be most beneficial to the people in industry and commerce, to the community, and to the physician himself.

We must have no illusions that next week or next month there will come a sudden and impelling demand from industry for a great volume of service in preventive medicine. Nevertheless, the whole direction of the industrial health program has been moving firmly, and with an accelerated rate, toward an emphasis on keeping people well. Many of the larger industrial organizations have recognized the need for a greater emphasis on preventive medicine by materially extending the scope of their health programs. Some smaller companies have developed comparable services, and the trend in this direction is unmistakable. The medical profession must be prepared to provide the needed service with understanding, with adaptation, and with the specialized training that will be required.

Status of Preventive Medicine

For the busy practitioner of medicine, the burden of caring for the sick and injured often leaves little time or opportunity for a major direct effort that is clearly defined "preventive medicine." He recognizes the element "preventive" in the work of his associates in public health, in the activities of the school physician, in the inoculations and well-baby examinations in pediatrics and, where he has acquaintance, in certain aspects of industrial medicine. On reflection he will find that many of the daily activities of the general practice of medicine have an important "preventive" component. He will recognize, however, that these circumstances more often than not are incidental to, or a by-product of, the treatment of a disease condition. The opportunity develops as a result of an illness, not as a positive and original effort to prevent disease, or, more appropriately, to maintain health.

This is not an indictment of the practice of medicine thus far, nor does it, of course, diminish the value of these preventive efforts. Properly, we have first dealt with those matters of more immediate concern, the care of the sick and injured, and it is only when this job seems to be under some measure of control that we can turn our attention to the basic problems of prevention. It has been a characteristic of community development that a competent fire department precedes an effective fire prevention program.

The present organization of medical practice is predicated largely on a basis of curative medicine, and this has been the traditional orientation, beginning in our medical schools. It is not an impossible task, but certainly a difficult one, to divert the interest of the third and fourth-year medical student, even temporarily, from the diagnosis and cure of disease to the problems of prevention. He will accept a momentary respite to hear of the specific techniques that have been applied successfully in the control of infectious disease, but the matters that he feels are more remote from the traditional practice of medicine and from his probable direct activity, such as the problems of mental health and of industrial environmental control, are likely to receive little attention. With our undergraduate curriculum already bursting at the seams, there is little likelihood of adding much more in the way of specific training in industrial medicine. We must somehow show him that the diagnosis and treatment of lead poisoning and silicosis are much less challenging, much less intellectually stimulating, than the prevention of these diseases. And we must

From the Eastman Kodak Company.

Read in the Symposium on Progress in Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

convince him of these changes that will demand a greater emphasis on prevention and of his essential role in applying preventive medicine in industry.

The economics of medical practice has developed in relation to the diagnosis and treatment of disease. The price of an appendectomy is a well-recognized entity. But how do you charge for a few years' increase in life span achieved because you have helped your patient or, even more remotely, a group of patients not to become obese or have aided him directly or through his employer to avoid the excessive intake of an occupational poison? Even when the cost for an occupational injury or illness is accepted by industry, as in a case that comes under the workmen's compensation laws, the fee is established on a basis of the diagnosis and treatment and makes no provision for a preventive follow-through by the physician if he should feel that such a step were indicated and that he had the training and competence to do so. The character of many of the services that are an integral part of an effective program of preventive medicine in industry makes extremely difficult, if not impossible, a remuneration of the physician on a fee-for-service basis. In many smaller communities there remains considerable resistance on the part of doctors to accept any financial relationship that does not have a traditional sanction. This matter is noted because it is an important element in developing the conditions that will permit the physician to broaden the scope of his service. Fortunately, there is now a wider acceptance of the principle that the unit fee for service may not always provide the best means of compensation and that an hourly, monthly, or annual stipend is an ethical and more realistic method in certain circumstances. The physician serving industry should take the initiative in suggesting a method of remuneration that will permit greater effectiveness of his service.

A number of important developments are likely to have a major influence in modifying the traditional relationships in the practice of medicine, particularly with relation to the application of preventive medicine in industry. One of these has to do with the increasing awareness by the general public and by the medical profession of the significance of prevention of disease. A second is related to the structural change in our society, with the progressive industrialization.

Awareness of Public

Many of the preventive measures that have added so greatly to the span of life and to the decrease in morbidity from infectious diseases have been applied with little direct effort on the part of the individual who has benefited. For example, the sanitary control of water and milk supplies, which has so successfully decreased the incidence of typhoid fever that an epidemic involving less than 200 people becomes national headline news, is operative in most of our communities with little or no recognition by the general public. Similarly, such diseases as cholera and plague are held in check by a quarantine mechanism identified to the public only when it temporarily fails. Many of us find it difficult to believe that not so many years ago it was not uncommon for a third of the people of a city to die, in the span of a few weeks, from one of these epidemics. One by one, the infectious diseases, smallpox, tuberculosis, malaria, yellow fever, diphtheria, pneumonia and, hopefully, poliomyelitis have been eliminated or are being brought under effective control.

With these advances, the average span of life has doubled in less than a century, but this gain has been added chiefly to the earlier years of life. For example, of the 20-odd years that have been added since 1900, only 3 have been added after age 40. That is, while the infant now will live 20 years longer than the infant of 1900, a person 40 years old will live only 3 years longer than the 40-year-old in 1900.

Heart disease, cancer, arthritis, mental illness, and accidents have displaced the infectious diseases as the major causes of morbidity and death. It is obvious that a different kind of approach is needed to prevent these conditions. An effective program, particularly against degenerative disease, is much more likely to involve the active and considerable effort of the individual in whom the disease is to be prevented. The locus of this operation will change from the site of application of impersonal mechanisms, such as sanitary controls of water, milk, and meat, to the area of personal contact between the subject and the physician. Many events in recent years have focused public attention on the importance of prevention. Some of them are the impetus from the poliomyelitis story, the barrage of advertising efforts of organizations developed around heart disease, cancer, mental illness, muscular dystrophy, and a host of other illnesses, and the increasingly dramatized illnesses of prominent people.

Industrialization of Society

The second major factor noted above, the industrialization of our society, merits consideration. The proportion of our population living in urban communities increased from 40% in 1900 to 64% in 1950. This change in the character of our way of life is even more dramatically emphasized by the transfer of farm workers to industrial and commercial occupations. The proportion of our total civilian labor force in farm occupations dropped from 38% in 1900 to less than 12% in 1950.

The change in the basic structure of our society has involved much more, with respect to medical care, than the simple transfer of patients from the country practitioner to his city confrere. Work in factories, mills, mines, and commercial units has become more complex; the organization into labor groups has grown tremendously; work benefits involving the organization and economics of medical care have pyramided; and industry has enlisted the closer cooperation of the physician in promoting a more effective operation.

In many of the larger industries, there has evolved a concept of medical practice with many elements and activities that are quite different from those commonly encountered in other phases of the practice of medicine. These factors involve, chiefly, the area of preventive medicine applied to the industrial setting.

The emphasis is on maintenance of health with a positive approach and with a program aimed at keeping people well and working. The care of occupational injury and disease is important, but the occurrence of these is always an admission of failure, a defect in a prevention-centered program. The acceptance and constant extension of this kind of industrial health program by the larger companies is a measure of its essential value.

If one looks at the distribution of the working population by the size of industrial or commercial units, it is quickly recognized that medical service by full-time industrial physicians will reach only a portion of the industrial population. Ordinarily, a plant with less than 1,000 employees cannot justify the employment of a full-time physician. Thus far, there have been remarkably few instances of smaller organizations successfully joining together to employ a full-time doctor. Less than 1% of the industrial plants in this country, some 2,000 units in all, employ more than 1,000 workers, although these larger plants have nearly 35% of the industrial working force. The other 65% of industrial employees, more than 10 million people, are in plants of less than 1,000. If these people are to share in the benefits of the kind of an industrial medical program that is available to the workers in the larger plants, the service must be supplied largely by physicians serving industry on a part-time basis.

There are, of course, many physicians presently serving industry by caring for patients in compensation cases and perhaps performing preemployment examinations. This is a beginning, but, if the service ends here, it falls far short of satisfying the ultimate need and opportunity. Admittedly, the industry so served may feel that it is getting all of the service it needs or can afford. This was the initial attitude of many of the larger companies when the physician was first employed. The evolution of a broader program of preventive medicine was stimulated in part by the imagination and the effective performance of the full-time industrial physician. But the acceptance by industry and the extension of the program have been on a basis of hard-headed, critical, and economic judgment of the value. These same values apply to the smaller industrial units as well as to the large companies.

Industry's interest in the health of its people extends far beyond that of the mere prevention of occupational injury and disease. The economic factor is of prime importance in this interest, but many companies that have initiated a program on this basis have found other substantial benefits, such as improved industrial relations.

Industry's stake in the prevention of illness is increasing at a rapid rate. The attitude toward absenteeism has changed from one of indifference to a serious concern. Some two-thirds of the total absence from work is due to illness, with a direct cost amounting to 5 to 10% of the total payroll cost. This direct cost can be measured in terms of decreased production or in the increased number of employees required to assure full production. The practice of paying a sickness allowance or benefit for absence due to illness is now widely followed. Among the so-called fringe benefits, the payment by industry of at least a portion of the hospital, surgical, and major medical expense insurance costs is an increasingly common occurrence. The ever more liberal interpretation of workmen's compensation laws has raised the cost of this insurance to a point where prevention of injury and disease takes on a new significance. These conditions and practices are not limited to the larger industries, and, as they extend to more and more companies, many additional physicians will be called on for advice and direct help.

Program and Responsibilities

The program of preventive medicine should begin with the examination of the applicant for a job. The examining physician who is familiar with the job requirements, as a result of sufficiently frequent observation of actual work conditions in the plant, is much better able than one who is not to match the capabilities of the applicant with these requirements and to give real meaning to the term preplacement examination. The physician who is asked to perform these examinations may be reluctant to suggest to the employer that he would like to see the plant and even more reluctant to discuss compensation for doing so. I believe that the physician, in frankly discussing this matter with the employer, would be pleasantly surprised at the specific result and frequently would open the door to a discussion of a broader service for his employers.

This preplacement examination frequently is the first contact of the applicant with a physician that is not the result of an illness or injury. It is the golden opportunity to begin a sound program of health education. The examiner must never forget that he is dealing with a person, not a pair of hands and eyes, a heart, and a spine. So much of his future success in working with this individual depends upon the rapport that he is able to develop by sympathetic and helpful handling at this first examination.

Even if there is no suitable work for the particular applicant, the physician may be able to counsel him concerning the correction of defects or advise him as to activities that are compatible with his capabilities. This must not be done lightly, for the result may mean a major reorganization of his life and ambitions. For example, a graduate organic chemist who applied for work in that field had a moderately severe residual dermatitis. He gave a history of repeated attacks of dermatitis dating from his first experiences as a student in the chemistry laboratory and had abandoned work on four different compounds identified with four separate exacerbations of his dermatitis. On one occasion he had been hospitalized for three months and had missed a semester of schooling. Although he had been seen by a number of physicians, no one had suggested a change in vocational direction. During his preemployment examination he was advised that, even if he were employed as an organic chemist, there was great likelihood of recurrence of the dermatitis and ultimate limitation of his opportunities in this field. He was not advised to change, only given the facts as clearly

as possible. On the basis of this discussion, he returned to school for another year of physical chemistry and has been happily employed in this field for nearly 10 years with only minor skin irritation.

The preplacement examination has been emphasized here because frequently it is the first element of a program of preventive medicine in industry in which the part-time physician is asked to help. It can be a perfunctory program of selection or rejection of applicants, with the physician playing an impersonal, mechanical role. Or it can be a warm, instructive, and helpful experience to both applicant and employer with direct benefits to the physician.

The control of hazards from occupational chemicals and physical agents is generally accepted as a direct responsibility of industry. The number of such agents and the increasing complexity of industrial operations have resulted in the development of a highly specialized discipline, industrial hygiene. The industrial hygienist has acquired from clinical experience and animal experimentation a most useful set of criteria to guide in the control of plant exposures. The larger industries and those with very hazardous operations may employ a highly trained individual or a team of individuals, including chemists, physicists, and engineers. It cannot be expected that the physician who serves a plant on a part-time basis will become a diversified industrial hygienist or toxicologist, but, if he is to do his job properly, he must become familiar with the nature of the hazards in those establishments where he has accepted a responsibility. His role may not be an easy one, for, if the controls are inadequate, poisoning may occur; if needlessly severe, the cost of production may exceed that of competitive operations and seriously handicap the company.

The physician who has had no special training in this field should be cautious in giving an opinion concerning the control of a hazard until he has obtained authoritative information. It is not uncommon for the worker or his management to confront the physician with such a problem with an apparent expectation that a complete answer will be given immediately. It is possible to spar gracefully for time, and a correct answer given later will justify the delay.

With the development of effective industrial hygiene and safety programs, industry's attention has turned to the prevention of personal illness. In my own company's experience, more than 60 times as much absence occurs from personal illness and injury as from direct occupational causes. The performance of the worker is not just a matter of muscle and reflexes but is influenced by the whole gamut of factors that affect the whole man, physical, mental and emotional. This does not mean that industry is going to provide total medical care, but, with the valid interest of the one who is paying an increasing part of the bill, there is certain to be a closer relationship to community medical activities. Industry will need constructive counsel and advice in these matters, many of which involve preventive medicine in its broadest aspects.

Opportunities for Extensive Aid

I have discussed only a few of the many phases of a program of preventive medicine that now are a regular part of the medical activities in a number of the larger companies. Such activities include periodic examinations and examinations at the time of transfer to other work, at the time of return to work after an illness, on termination of employment, of special groups such as executives and other members of management, and of workers exposed to hazardous substances. Each of these occasions offers an opportunity to counsel the individual on health matters at a time when his attention is not confused by the problem of recovering from an illness. The detection of many potentially serious conditions in an early and correctable stage has real meaning and provides, with the continuity of employment, an opportunity to encourage correction.

Health education, with the employment of group mediums, such as conferences, displays, motion pictures, and articles in the company publications, can be made most effective. If the company provides facilities for meals, the cooperation and active participation of the cafeteria management can do much to improve nutrition. Sanitation controls may cover the food service and its employees. In many plants, the physician plays an important role in advising about effluents that might give rise to air and water pollution problems for the community. Specific programs against infectious disease such as influenza and tetanus are sometimes justified on a selective or mass basis. The physician can play an important part in improving mental health in his plant population by aiding in training supervisors with respect to the basic elements in human relations and by recognizing trouble spots in the plant from the nature of the complaints that bring people to a sympathetic medical department.

In closing, I want to call to your attention an important finding, reported by the Metropolitan Life Insurance Company some months ago. The life span of the industrial worker, as measured by that company's experience, had for the first time equaled that of the general population. This is in contrast to the status some 40 years ago, when the industrial worker had an expectancy of life some 6 years less than that of the individual not employed in industry. The relatively tremendous gain in longevity by the industrial worker has occurred in spite of the fact that this was also the period of much greater use of hazardous materials and equipment. Certainly, one phase of preventive medicine in industry, the control of the industrial environment, must have been an important factor in this achievement. The opportunity is offered the medical profession to take a leading role in a most promising application of preventive medicine. The insight, the effort, and the positive direction that we exert in aiding and guiding the development of preventive medicine in industry will be a significant index of our maturity.

343 State St. (4).

PREVENTIVE MEDICINE IN AGRICULTURE

Franklin H. Top, M.D., Iowa City

• *The health problems of the agricultural worker are numerous and important, and some have not been solved. Better reporting and classification of accidents is essential, for in 1954 there were 1,200,000 injuries on the farm, with 14,000 deaths.*

Infections of animals are transmissible to man in many instances. Among the most important of these zoonoses in the United States at this time are anthrax, brucellosis, arthropod-borne encephalitis, Q fever, rabies, salmonellosis, trichinosis, bovine tuberculosis, and tularemia. Progress here also depends on improved reporting.

The farmer is exposed to innumerable new chemicals, including pesticides, growth stimulators, and antibiotics. Greater awareness of their danger is desirable. Skin disease from bites and irritants, pulmonary disease from dusts and pollens, gastrointestinal disease from poor sanitation, and disturbances of mental health assumed to be more common in rural than in urban areas require further investigation. An Institute of Agricultural Medicine has been organized in Iowa in an effort to make sure that special attention will be devoted to these problems.

A symposium such as you are participating in today would not be complete without including the problems of preventive medicine in agriculture. This statement might lead one to conclude that there is a body of knowledge concerned with the health of and the prevention of disease in the agricultural worker. There is some knowledge, but, as far as I can determine, there is little shape or form to it. There are many bits of information here and there, but there is no integration of facts. In this respect preventive medicine is in much the same position as industrial medicine was prior to the 20th century. Industrial medicine is actually of ancient origin, but a status comparable to that of other branches of medicine was not achieved until the present century.

The term "industrial medicine" denotes medicine as applied to the worker in industry, and, to many, the industrial worker is a factory worker. This concept of industrial medicine is too narrow, for it does not encompass a host of other workers unrelated to the factory; one such group would be agricultural workers, although farming is not generally considered as an industry.

Johnstone [1] in his book, "Occupational Medicine and Industrial Hygiene," discusses the retardation of progress in occupational medicine over the centuries and finds that only within our time has it come of age. In explanation, he raises several questions and asks, "Why is it that America has no adequate system of rural medicine?" The health of the agricultural worker may be as good as that of his factory brother, but the advantages of the countryside are offset by hazards peculiar to the farm as a workshop. Both industrial physicians and hygienists have felt the inadequacy of the term "industrial hygiene" to cover the problem of the health of the worker, and the term "occupational medicine" is rapidly replacing it. Too, these individuals are apprised of the lack of attention to the health of farm people as a group.

In the discussion to follow, it will become evident that the health problems of the agricultural worker have been neglected, and this importantly includes preventive aspects as well. Preventive medicine in agriculture is, then, in its infancy, and I speak to you, not as an expert, but as a neophyte in this field. I hope you will forgive me the frequent references to Iowa, particularly when discussing new developments in agricultural medicine.

Farm Accidents

Accidents from all causes play a leading role in death and disability for all segments of the population; at the present time motor accidents head the list. Taking a cue from the state of Kansas, many states are beginning to report accidents, but notification remains poor. Much information may be gained by studying the booklet "Accident Facts," which is annually released by the National Safety Council. However, in the realm of farm accidents the information is quite spotty. The following figures are obtained from the 1955 edition. In the United States in 1954, deaths due to farm accidents totaled 14,000, a rate of 61.7 deaths per 100,000 farm residents. The total number of injuries was 1,200,000. Even on the farm, motor vehicle accidents were responsible for the greater share, with some 5,900 deaths, for a rate of 26. Work accidents numbered 3,800, with a rate of 16.7, and farm home accidents totaled 3,500, giving a rate of 15.4. Public non-motor-vehicle accidents accounted for 1,300 deaths, a rate of 5.7 deaths per hundred thousand farm residents.

Of 1,200,000 injuries on the farm, 530,000 were attributed to farm home accidents. Farm work, motor vehicle, and non-motor-vehicle accidents resulted in 310,000, 210,000, and 160,000 injuries respectively. These figures are not as clear-cut as one might hope for. For instance, accidents that occur during the performance of ordinary household or light farm duties, commonly designated as chores, are classified as home accidents. Furthermore, deaths from motor vehicle accidents resulting from work activities are included both in the motor vehicle and work totals; this duplication in 1954 accounted for 500 deaths. Included with major industries, farming is third in the number of deaths per 100,000 workers.

Among the principal sources of accidents fatal to farm people, motor vehicle accidents were responsible for over 40% of accidental deaths in 1954; most of the

[1]Head, Department of Hygiene and Preventive Medicine, and Director, Institute of Agricultural Medicine, State University of Iowa College of Medicine.

Read in the Symposium on Progress in Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

accidents happened off the farm. Falls accounted for about 2,000 deaths, of which 1,300 occurred in and around the home and 700 in the course of farm work. Tractor accidents account for 700 deaths a year. One thinks of a tractor as utilized principally on the land, but many of the deaths incident to work with tractors do not occur in actual farm work. In recent Minnesota and Iowa studies, essentially one-third of the tractor fatalities occurred in highway accidents. Surprisingly, a fair proportion of the fatalities do not occur among operators of the machine. Wisconsin and Ohio studies over a period of a year indicate that roughly 11% of the victims were children under 5 years of age and an additional 5% were between the ages of 5 and 9 years.

Wardle,[4] at Iowa State College, has carried out numerous studies in the state of Iowa relating to farm accidents and has been very active in the Iowa Farm Safety Council. He has been particularly interested in specific problems and recently reported on 2,519 corn-harvesting accidents that occurred in Iowa between 1947 and 1954. Among aspects studied were the specific danger points of the corn picker itself. In relation to this study and others, Wardle has been interested in the time of day that accidents occur. He finds that there is a peak midmorning and midafternoon period during which the majority of accidents occur. In terms of prevention, Wardle's studies serve as information for a column that has appeared in the *Wallace Farmer* over a number of years and also for a number of other press releases. Pamphlets on items relating to common causes of farm accidents are continuously being released through the state Agricultural Extension Service. Highlighting corn picker accidents in Iowa probably has accounted in large part for the marked decline in corn-harvesting accidents from a high of 561 in 1952 to 229 in 1953 and 200 in 1954.

The high level of work accidents on the farm is partially due to the shift from horse-drawn to motor-driven machinery. There is the matter of fatigue and failure to observe rest periods. Horses had to be rested periodically, and with this came rest for the driver. Furthermore, the same horses could not be worked 10 to 15 hours a day for several days. At present, it is not unusual for a farmer to spend more than 10 hours in the field with a tractor. Darkness appears to be no deterrent to further work, for with strong light he continues with the work at hand, often with few or no rest periods; sometimes a meal is omitted. A case in point is the farmer who came in for lunch and found that his wife had not yet prepared the food. Disgruntled, he took a glass of milk, stomped out of the house, and went back to work. Within an hour he was involved in a tractor accident that led to loss of a hand. Such instances can be multiplied many times. Mental attitude, press of work, and accident proneness are likely factors affecting the agricultural worker. In industry, the highly mechanized operations of today necessitate periods of rest, the so-called coffee breaks, and some operations are of such a nature that a change in type of work is made on a two-hourly basis. Farming, too, has become highly mechanized, but, with a late start occasioned by weather and soil conditions to goad him, the farmer simply works on without resting, and this invites trouble, particularly in the spring after a winter of relative inactivity. Long hours of sitting on a tractor or other mechanized unit is probably conducive to back pain, kidney and bladder conditions, hemorrhoids, and hernias.

To fatigue, as a factor in the increase in farm work accidents, must be added carelessness in the handling of machinery and poor safety design. In general, manufacturers of farm machinery have been interested in performance, and safety has been a secondary consideration. In recent years, safety has been emphasized to a much greater extent. Safety features, however, are not always appreciated by farm workers. In many instances, accidents have been attributed to the removal of safeguards on machinery. The safety guard appears to the operator to interfere with performative efficiency or speed. In the process of making a minor repair, he fails to replace the safety device, considering it nonessential.

Much work has been done to inform agricultural workers of the hazards of farm machinery, but, as with the automobile, the advice must be heeded. The agricultural worker must realize that accidents can happen to him. How can the dangers inherent in handling farm machinery be emphasized? Principally, by personal contact with the farmer, fortified by information in printed form that is easily read and quickly grasped. In this regard, the state extension services are doing a fine job, for farm and home safety is seriously considered by county farm safety committees and other rural groups, which are receiving and giving out program outlines, bulletins, leaflets, and books and are borrowing motion pictures, slides, and film strips.

Health Problems of the Farmer

Several health problems peculiar to the farmer come immediately to mind. Some will be discussed in greater detail than others, but those mentioned are already apparent and have been known for a long time.

Zoonoses.—The zoonoses may be defined as infections of animals secondarily transmitted to man. Hull[2] cites 115 diseases in this category; some 80 have been described in the United States and more than 40 in Iowa. Among the more important in this country at the present time are: anthrax, brucellosis, arthropod-borne encephalitis, leptospirosis, Q fever, rabies, salmonellosis, trichinosis, bovine tuberculosis, and tularemia. In Iowa, brucellosis, salmonellosis, and trichinosis are of particular interest. Many communicable diseases affecting man are reportable, although they have been reported only poorly. However, relatively few animal diseases are reportable and at present nationwide reporting rests on the initiative of the owner of a sick animal or on the veterinarian or veterinary agency. The necessity of notification of animal diseases and its important relationship to the occurrence of animal diseases transmitted to man is aptly pointed up and documented by Karl Meyer[3] in a recent monograph on "Zoonoses in Their Relation to Rural Health." The health of the farmer and of the consumer of his products is affected by control of infection among the animals he comes in contact with. As Meyer[3] indicates, prevention of the diseases in question must rest on adequate notification of animal diseases, verification of diagnosis, if possible, and collection and analysis of data resting on these reports.

Only by these means can adequate incidence data on the zoonoses be obtained, adequate control measures applied, and efficacy of control measures determined. It is obvious that the key people in prevention of the zoonoses are veterinarians and general practitioners; each must immediately report on disease when and where it is found.

There are other diseases less commonly encountered in Iowa and elsewhere that demand attention, study, and research, namely, histoplasmosis, psittacosis, and rabies. To illustrate, several recent reports indicate that the host range of rabies among wild, semidomestic, and domestic animals has increased considerably, and attention has lately been called to a much enlarged reservoir, including nonsanguivorous bats indigenous to many of our states.

Farm Sanitation.—Sanitary facilities on the farm are often taken for granted, no matter how well kept the farm may be. On the farm, water supply and sewage disposal are on an individual basis and are not open to frequent inspection, as is the case with community water and sewage disposal systems. How often does the farmer have his well water tested? How frequently does he give thought to whether the effluent from his septic tank is coming to the surface? There are hazards connected with impure water from the handling of milk and milk products and other items of food grown on the farm. Impure water may be the cause of methemoglobinemia affecting young infants, the result of too high a nitrate content. Gastrointestinal infections such as typhoid and paratyphoid, amebic and bacillary dysentery, and gastroenteritis may also occur. In general, infections traced to contaminated well water do not attack the family nearly as often as they do friends who may pay a short visit to the farm; the farm family is immune by reason of long-term contact. The use of impure milk and milk products and other foods may result in food infection and food poisoning.

Skin Diseases.—There are many skin conditions which result from agricultural pursuits. Direct contact with cultivated plants or weeds such as primrose, poison ivy, poison oak, sumac, and ragweed may result in dermatitis. Farmers are often in contact with detergents or defatting agents that may affect the skin adversely. Fungus infections are not uncommon to agricultural workers. Examples of such infections are ringworm, "sheep skin" (sycosis of the neck and hands), blastomycosis, actinomycosis and sporotrichosis.

The bites or stings of arthropods cause lesions that may become secondarily infected. The bites of common nuisances such as flies, mosquitoes, gnats, spiders, and ants are very troublesome to some individuals. The fine hair of caterpillars may cause extreme irritation of the skin and a generalized systemic reaction. Farm workers are usually exposed to insects in much larger numbers than persons living in urban areas. This is particularly true for mites, chiggers, lice, and fleas. "Harvest itch," sarcoptic mange (animal scabies), and ground itch due to animal hookworm may result in dermatitis. Physical agents such as sunlight, moisture, and extremes of temperature also have their deleterious effects.

Pulmonary Disease.—Some acute lung diseases are due to inhalation of dust or pollens encountered on the farm. Chronic bronchitis may be contracted and asthma is not uncommon. Plant spores, dust, animal dandruff, and inhalation of fumes or solvents are frequent offenders. Continued exposure to lung irritants may cause a chronic inflammatory state that necessitates termination of farm work for the individual.

Chemicals.—Chemicals are freely used on the farm for combating insects or arthropods that do damage to crops. Chemicals may also be used to eliminate common house and barn nuisances such as houseflies, mosquitoes, gnats, ants, and rodents such as rats or mice. For general purposes of control, chemicals can be divided into insecticides, fungicides, herbicides, rodenticides, fumigants, fertilizers, and bactericidal agents. A recent release from the Committee on Toxicology of the American Medical Association indicates that there are a quarter of a million brand name chemical products that may be used in the home, farming, and industry. All may be useful but handled improperly may result in severe illness of human beings or animals. Besides acute effects, chronic delayed reactions and infections may occur. It is estimated that each year there are 3,300 accidental deaths from misuse of chemicals. No complete catalogue has been made of all available products, nor of the combinations of chemicals used at the present time. Inhalation of dust, fumes, vapors, mists, and gases is known to be a dangerous mode of entrance of poisons. Other important modes are swallowing of material in saliva, water, or food, absorption through the skin, and traumatic entrance through cuts in the skin or mucous membrane.

At the December, 1955, meeting of the American Association for the Advancement of Science in Atlanta, Ga., a symposium was held on the topic, "How Dangerous Are Household and Agricultural Chemicals?" The question was covered by members of the Committee on Toxicology and the Committee on Pesticides of the American Medical Association. Topics discussed were new chemicals, storage of small amounts of DDT in human beings, harmful effects of chemicals on the skin, and the main channels through which harmful materials can enter the human system. Summing up, one of the participants stated that the consensus of the meeting was that top priority in chemical accident prevention programs should be given to increasing safety awareness of laymen, wider use of precautionary labeling on products, and more accuracy in death certificates and hospital records through proper identification of the poisonous agents.

Mental Health and Psychiatry.—A number of problems in psychiatry and psychosomatic medicine are of more than academic interest. The statement, "Mental depression is more common among rural workers," is found in some psychiatric textbooks. Is this statement a fact? Are farm workers more accident prone than workers in other occupations? Are they more careless in their attitude toward hazards connected with machinery or with the handling of animals and birds? Greater emphasis is being placed on mental health, and attention in this field should include residents of rural areas.

Growth Stimulators.—In order to put more weight on animals and birds raised for food consumption, diethylstilbestrol and antibiotics have been used for the purpose of growth acceleration. Studies are being carried on with relationship to the hazard of diethyl-

stilbestrol and antibiotics remaining in food derived from animals that have received the substances. More research needs to be directed to this problem in order to determine if hazards are present.

Iowa Program for Investigation

From the review of some of the problems confronting the farmer noted above, one would gather that there is ample reason and opportunity for investigation of conditions affecting the health of the agricultural worker. Iowa is a predominantly rural state and, along with similar states, is of great importance to the national economy. It seemed appropriate, then, that research in agricultural aspects of medicine be first established on an organized basis in Iowa. Departments and divisions of industrial hygiene in graduate schools have made significant contributions to the health of the industrial worker. Impressed by the challenge, the establishment of an institute of agricultural medicine at the State University of Iowa College of Medicine was seriously considered. A three-year grant was received from the W.K. Kellogg Foundation to establish an institute and, as of Sept. 1, 1955, work on the Institute of Agricultural Medicine was begun and procurement of personnel undertaken.

The following staff members were considered desirable for the first year of operation. 1. An associate director was selected with knowledge and facility in fields allied to medicine. The person appointed comes with experience in a number of disciplines. He holds masters degrees in microbiology and chemical engineering, a doctorate major in industrial hygiene and a minor in sanitary engineering, and a certificate in safety engineering. The company by which he was formerly employed makes insecticides and pesticides. 2. A social anthropologist, rurally oriented, was appointed. One cannot study disease without considering accompanying social implications. There are a number of cultures in Iowa and, though the groups represented may be small, study with relation to differences that might appear was considered worthy of trial. The cultural groups include American Indians, the Amish, the Mennonites, and sizable segments of population of German and Bohemian extraction. 3. A veterinarian, preferably with public health experience, was considered necessary since the zoonoses are important. 4. A statistician was needed for the collection, compilation, and testing of data. During the next two years, as conditions permit, a toxicologist, a safety engineer, and a health educator may be added.

Plans for the institute are essentially as follows. Along with consultants, staff members will attempt to determine the number, the extent, and the importance of the health problems confronting the farmer, particularly in Iowa. All known sources of information will be tapped. Close working relationships are already being developed with farm organizations, health departments, physicians, and hospitals. This problem will not be as readily accomplished as might appear at first sight. Most of the conditions affecting the agricultural worker are not reportable, hence a means must be found to determine at least in a rough way what the problems are. The exact approach has not been decided upon, but the survey method will likely have to be used for a few representative counties in the state.

Having determined the problems involving the health of the agricultural worker, it appears that the next phase would entail their assessment on the basis of adequacy or inadequacy of present methods of prevention and treatment and the necessity of fostering research in their solution. In order to investigate specific problems, the institute will collaborate with the Iowa State Medical Society, the state hygienic laboratories, the state department of health, many departments in the college of medicine, the college of veterinary medicine, the extension service in the college of agriculture, and the college of engineering at the Iowa State College at Ames. In addition, we hope to establish a close working relationship with the Iowa Farm Bureau Federation, the strongest independent farmer group in Iowa. The importance of the general practitioner cannot be overlooked. His intimate knowledge of the families and community he serves is paramount to success in undertaking the program outlined.

The institute will be oriented largely along the lines of preventive medicine and public health and is under the jurisdiction of the department of hygiene and preventive medicine of the medical school. Provision of adequate medical care and development of new methods of health education for rural populations are important considerations. The results of past labors, of present work, and of future research must reach the farm worker in understandable terms, and preventive procedures must appear worthwhile before general application can be expected to be effective or more effective than now obtains. The establishment of the institute is on a modest scale, and it is hoped the state of Iowa will furnish funds for continuation and enlargement of activities after the grant is terminated. The present effort is looked upon as a beginning attempt to solve farm health problems and to direct efforts toward their prevention. Besides the purposes mentioned, pertinent data relating to agricultural medicine will be collected and collated and be made available to any interested worker or group that can use it. Problems will be reviewed from time to time, and all current reports will be abstracted and catalogued.

Summary

Some serious health problems confronting the agricultural worker have not been solved. Although work in the field of agricultural medicine has been carried out in the past and is presently under way, little attention has been given to the over-all problem. Because of poor reporting of the zoonoses and of other diseases affecting the farm worker, the basis for sound preventive measures is not available for many diseases. The Institute of Agricultural Medicine has recently been established at the State University of Iowa College of Medicine to determine the important problems affecting the health of the farm worker with the hope that investigation may lead to solution of some of them.

References

1. Johnstone, R. T.: Occupational Medicine and Industrial Hygiene, St. Louis, C. V. Mosby Company, 1948.
2. Hull, T. G.: Diseases Transmitted from Animals to Man, Springfield, Ill., Charles C Thomas, Publisher, 1955.
3. Meyer, K. F.: The Zoonoses in Their Relation to Rural Health, Berkeley, Calif., University of California Press, 1953.
4. Wardle, N. J.: You're Not Safe Yet, Iowa Farm Science **10**: 9-12 (Oct.) 1955.

CURRENT PREVENTIVE PROBLEMS OF CHILD HEALTH

Leslie Corsa Jr., M.D., Berkeley, Calif.

• *Problems hitherto of secondary importance in child health are becoming more conspicuous because others formerly of primary importance have been solved. Premature birth has become one of the largest problems, and attention should be shifted somewhat from its treatment to its prevention. This would help to reduce perinatal mortality and morbidity and to avoid the dilemmas relating, for instance, to incubators, oxygen, and retrolental fibroplasia.*

Infections by micro-organisms remain the greatest cause of death, of hospitalization, and of disability, and the most prevalent and serious are the acute respiratory diseases. Another important cause is accidents, and a third is chronic disease. Methods of prevention and techniques for health supervision are still evolving. The private physician has a unique opportunity to guide the direction of future progress.

Preventive medicine as an integral part of the practice of medicine is nowhere so highly developed as in the branches concerned with human reproduction and with human growth and development: obstetrics and pediatrics. It is no mere coincidence that the greatest progress in preventive medicine during the 85 years since the founding of the Los Angeles County Medical Association has been in the field of maternal and child health. I am taking it for granted that we are all so familiar with the dramatic declines in maternal, infant, child, and youth mortality and morbidity rates since the turn of the century that there is little point in repeating them here. Instead I should like to turn our attention to consideration of what are emerging as major preventable problems of child health in 1956.

Present Efforts in Prevention of Premature Births

Premature birth is one of the largest problems. As you know, much more study and effort have gone into keeping premature infants alive after birth than in keeping them in utero until sufficiently developed to survive. Following recommendations of the World Health Organization's Expert Committee on Prematurity in 1951 and those of two large conferences on premature births held here during 1952, California's medical and public health professions are placing greater emphasis upon primary prevention of premature delivery itself. The present effort is threefold. First is the provision of good prenatal care to all pregnant women. This places upon the shoulders of those who practice and teach obstetrics and general practice a great responsibility toward the great majority of pregnant women who turn to them for care. It happens in California, as in the rest of the country, that the least prenatal care is received and the highest rates of premature births occur in the low economic group, who are cared for here largely in county hospitals. Several statewide and local studies are in progress at the present time with the object of seeking new ways to motivate these mothers toward wanting prenatal care, to eliminate obvious blocks that keep those who want care from getting it, and to provide a higher quality of care in areas where it is inadequate.

Second is the development of maternal and perinatal mortality committees to study the preventability of these deaths. County medical societies, health departments, and, more recently, the California Medical Association have all provided leadership throughout the state in increasing the number and effectiveness of such groups, which optimally include physicians in general practice, obstetrics, pediatrics, anesthesiology, pathology, and public health, as well as nurses, hospital administrators, and social workers. Those of you already working in such a group know well the value of this self-searching, educational approach. Others who are interested but have not yet begun the job would do well to visit active committees like those in Los Angeles, San Diego, Santa Barbara, and Orange counties, here in southern California.

Third is further research into the causes of prematurity, which I will not examine in detail here. We need, first, to sharpen our definition of prematurity itself. The present criterion of low birth weight (5.5 lb. [2.5 kg.] or less) established some 30 years ago includes a large number of small babies of normal gestational age, as well as excludes a significant number of larger babies who are actually premature by length of the mother's pregnancy. Recent studies from Baltimore, Boston, New York, and San Diego show that, contrary to our previous opinions, length of pregnancy based on the first day of last normal menses can be determined in all but a small percentage of pregnancies and is as reliable as birth weight in defining risk of death. More important, combining birth weight and length of the pregnancy corrects many of the limitations of weight alone. Use of this improved definition in detailed exploration of relationships between prematurity and maternal disorders, prenatal care, maternal nutrition, maternal occupation, and other social and emotional factors may provide clues to help us unravel the multiple mysteries of human labor.

One other problem warrants particular mention: retrolental fibroplasia. It has been hard to escape reading or hearing during the past year that a national cooperative study convicted oxygen in prolonged high concentration as a major culprit in the etiology of this disease, the principal cause of blindness in young children. Here is a good example of unintentional chemical poisoning resulting from the faulty hypothesis that, if a little is good, a lot is better. It

Chief, Bureau of Maternal and Child Health, California State Department of Public Health.

Read in the Symposium on Progress on Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

is, also, a fine example of the savings in time and in morbidity that result from pooling research efforts of this kind in order to obtain a large enough sample from which to draw valid conclusions. Unlike its recent counterpart relating to a well-known paralytic disease, the results of this study were first widely published and disseminated to the medical profession, who then made their own individual and group recommendations regarding the extent to which excessive use of oxygen in incubators for premature infants would be controlled. We do not mean to imply that the last word has been written about retrolental fibroplasia; in fact, we know that some cases will still appear among premature infants who receive no extra oxygen, but we would be remiss in early 1956 not to make doubly sure that everyone is well aware of the danger of too much oxygen.

I cannot leave the newborn infant without some mention of infant feeding—the natural kind. One important respect in which the United States differs from its sister nations is in the extent of breast feeding of its infants. The causes of the decline in function of the American breast to its present low ebb may never be clarified completely, but ranking high as contributing factors are the role of the American physician in devising and endorsing substitutes, the role of the American economy in mass-producing these substitutes, and the role of the American advertiser in equating the breast with sex. Despite many commercial attempts to imitate human breast milk, no substitute has been discovered that matches the natural product physiologically, in cost, or in ease of use. Rather, when we try too hard, we risk leaving out a vital factor, as in the recent epidemic of hypovitaminosis B_6 resulting from modification of a manufactured formula. There are indications that the pendulum has completed its swing to the right and that an increasing number of young American mothers in the present generation want to, and probably will, nurse their babies. There is every reason for us as physicians to encourage rather than delay this healthy trend.

Problems in Infectious Disease

Although infections receive only brief notice here, I should like to emphasize that, contrary to much written in popular and professional literature, diseases caused by micro-organisms remain the greatest cause of death, of hospitalization, and of disability among children in California. Most prevalent and serious are the acute respiratory diseases, both bacterial and viral. Enough was said of poliomyelitis in 1955, but few seem aware that meningitis remains a major killer of the young. We should never forget the necessity of considering possible meningitis early in febrile and obscure illnesses of infants and young children. Infection with streptococci, too, is receiving inadequate attention, not only in relation to its acute manifestations, but also in recognition of its key role in rheumatic fever and nephritis—two leading chronic diseases of the young. Prompt, adequate, sufficiently prolonged therapy of suspected streptococcic disease and also carefully supervised drug prophylaxis and follow-up of all patients with rheumatic heart disease are, in 1956, essentials of good medical practice.

Problems in Accident Prevention

There has been no doubt for many years that accidents are a major cause of mortality and morbidity in all age groups but particularly of children who are less prone to the diseases that kill and cripple older folks. Most of us agree that many accidents are preventable at the present time, yet relatively little is being done to prevent them. There are many reasons for this apparent apathy. One problem is that responsibility is so divided that it has remained nobody's responsibility. From the parents' viewpoint, although accidents are leading killers of their children, only one child in 5,000 dies from all accidental causes in a year. Serious accidents are rare enough so that it becomes easy to assume that they always happen to someone else's children. True, about one in 10 children sees a doctor each year because of accidents, but most of these are trivial and arouse little concern in either parents or doctors. When accidents do occur, most physicians are so busy treating the injury that they do not think to ask themselves whether it might have been prevented and so miss the opportunity to teach parents how to prevent the next one. From the community viewpoint, too, responsibility and interest are widely divided. Various agencies are independently concerned with motor vehicle safety, industrial safety, and school safety, but few pay attention to the home and family environment where most accidents to children occur. Some medical society child health committees and some health departments are moving to fill this gap, and many more in the near future will, I am sure, find this a fruitful area in which to concentrate their efforts.

Another problem is insufficient knowledge of the causes of many accidents. In this regard, the time is past when we should be speaking of accidents as a group, just as we have long since found it more useful to deal separately with such diverse conditions as tuberculosis, typhoid fever, and German measles than to consider them a group of infections. As we explore better ways to group accidents by causes, we are finding it essential to consider causes of accidents separately from causes of injuries resulting from accidents. Sometimes these are the same, but usually they differ, as in the case of the banana peel's causing a fall that directs a child's head into a radiator. One cure is to conceal or pad the radiator; but it is usually easier and more effective to remove the banana peel.

Because most attempts at prevention of accidents to children are new, many of our present preventive measures are based largely on theory and have neither been tested nor proved effective. Three kinds are commonly employed: environmental control, child protection, and child education. The first includes steps taken for mass control of hazards, such as requiring proper electric wiring and venting of heaters in houses, labeling of poisons, prescriptions for drugs, speed limits for autos, and removal of locks from unused

refrigerators. The second attempts to acquaint those directly supervising children, principally parents, with the chief dangers and to motivate them to act upon this information. Knowledge of the relationships of different kinds of accidents to the state of development of the child has been widely disseminated in recent years, much by insurance companies and much through physicians in their contacts with young families. We know, for instance, that we should concentrate preventive education dealing with infants to such things as falls from beds and bathinettes; with crawlers and toddlers to such things as poisons, foreign bodies, and household machinery; with older toddlers to such things as pedestrian-auto accidents and drowning, and so on up to that dealing with older youths who are driving cars, shooting guns, and also drowning. Perhaps, our greatest deficit in know-how comes in how to educate the potential victim himself to be alert to danger and, particularly, the potential victim who has already demonstrated high risk by repeated accidents. There is much to be said, in theory at least, for letting a child experience minor injury, such as a burn or submersion under proper supervision and after adequate warning of danger, as a means of learning how to avoid serious burns and drowning in later years. It is difficult to be alert to an unknown or totally unexperienced danger. But there is also much to be said for testing some of these ideas under everyday conditions before we espouse them as solutions. Physicians in practice, teaching, and public health are all in key positions, both to test such ideas and to put them into full action once they are proved effective.

It is interesting that one of the largest groups of accidental deaths of children under 15 years of age is the most easily eliminated from accident statistics and that physicians are in the best position to do this. These are the so-called accidental suffocations, sudden deaths, mostly in infants, which have been well established by several pathological studies throughout the United States to be for the most part due to sudden, latent infections, largely respiratory and of unknown etiology. Since we do not yet know how to prevent most of these deaths, we do not lower the death rate by requiring adequate autopsy and signing them out on the death certificate as infections, rather than accidents; but we do, by this simple act, almost halve the number of accidental deaths in infancy and assign their importance as a public health problem to its rightful niche.

It is also interesting that one of the smallest groups of accidental deaths in childhood, poisoning, is now receiving the greatest attention from physicians interested in accident prevention. The idea of poison control centers, initiated in Chicago two years ago, has spread like wildfire to dozens of other areas in the country from Boston to San Francisco. One good reason for this is the large number of possible cases of poisoning, especially in young children, that now come as emergencies to the attention of physicians with pediatric practices. In addition to providing expert advice on toxic ingredients and therapy for those relatively rare instances in which this is needed, such centers are proving of great value in measuring the extent of poisoning, in studying the basic causes of poisonings that occur, and in applying this current local knowledge immediately in what promise to be effective preventive programs. This same technique can and will be applied to other kinds of accidents. Another approach is the development of small expert committees, similar to the maternal and perinatal committees mentioned earlier, to study, case by case, the preventability of fatal accident cases and those requiring hospitalization in an individual hospital or community. Some of you particularly interested in accidents might well be among the pioneers in this endeavor.

Prevention of Chronic Diseases

I have already mentioned rheumatic fever and nephritis as important chronic diseases of the young. Cancer, particularly neoplasms of the brain, and leukemia also rank high, but congenital malformations top the list as a cause of death and serious disability among children and continue to be significant into adult life. Our knowledge of how to prevent these is pitifully limited to such measures as contraception for those few specific diseases that appear to be genetically dominant, extreme care in keeping pregnant or potentially pregnant mothers from exposure to x-rays, radioactive isotopes, and rubella, and perhaps not such extreme care in preventing exposure of young girls to rubella. This is a field badly in need of cultivation by large-scale cooperative studies of the type mentioned earlier to confirm and extend laboratory findings relating the incidence of various malformations to many nutritional, infectious, and other chemical and physical insults to the mother in early pregnancy.

Although not usually classed as a chronic disease, dental caries, like minor accidents, remains an important disease of highest prevalence despite the well-established scientific knowledge that, if we all drank water with the proper amount of fluorine added, easily controlled by simple engineering techniques, at least half of our present tooth decay would never occur. Although all of our medical, dental, and public health professional associations have repeatedly endorsed fluoridation of public water supplies, we have not all fulfilled our professional responsibilities to both our communities and our individual patients in taking local leadership on this issue. Instead, the small, highly vocal, and geographically mobile group of opponents in the name of everything from freedom of religion to communism have so far managed to outsmart us on many occasions. Here is one clear-cut issue on which your professional opinion stated repeatedly in public and in your private conversations, both in and out of the office, can directly influence the future dental health of your own children and grandchildren, and of countless thousands of others.

Other Goals

Our concept of health in 1956 is not limited to physical disease. I am sure we all agree with the World Health Organization that the health toward which we aim includes not only the absence of dis-

ease and disability, but also the greatest attainable physical, mental, and social well-being. This is, admittedly, a large order, but already medical leaders are active in primary and secondary prevention of mental retardation, behavior problems, juvenile delinquency, and other mental health problems of the young, as well as in fostering better physical and mental health of adults by providing opportunities for optimum growth and development of all our children.

The provision of medical health supervision for children is still evolving. Such services for infants, young children, and school children were initiated by medical leaders and voluntary agencies some 50 years ago and were rapidly expanded, as a joint function of medicine and government in the United States, to be available to all children. During this period a generation of physicians has been trained to provide these services as part of the practice of medicine, until today the vast majority of families of young children turn to their family doctor, be he general practitioner or pediatrician, for health supervision. There will always be, however, a significant group of young families who cannot pay the full costs of this care. For them, the medical and public health professions constantly need to devise better methods of making care available through new combinations of the family doctor and all other community resources. For no group is this more needed, and more difficult to provide, than for the families of migratory agricultural workers who traverse our green valleys, north and south, summer and winter. Both practicing physicians and agricultural employers in these areas have done much to alleviate the primitive conditions of these workers and their children, but the job is far from done. There will always be, too, new and changing health problems to challenge our present techniques and stimulate development of new ones. Few have before them the opportunity of the private physician for meeting such challenges of child health in both city and country and for guiding the direction of future progress in preventive medicine for our ever-growing new generation.

NEWER CONCEPTS IN CHRONIC DISEASES

Lester Breslow, M.D., Berkeley, Calif.

• *The problem of chronic disease must be attacked in two ways: by improved treatment and by more vigorous efforts at prevention. Improved treatment includes not only new methods of medicine and surgery but also increased emphasis on motivation, personal interest, family support, and community resources.*

The hope for prevention brightens as environmental influences on disease are recognized and means of controlling them are discovered. Some environmental factors in cancer are well recognized; some of them, whether chemical or physical, are occupational and amenable to control. Multiphasic screening projects are valuable in bringing about early daignosis of threatening disorders. The medical profession carries a substantial responsibility for the proper development of the campaign against chronic disease.

Perhaps the most important new concept in chronic disease is that something can be and is being done about it. We no longer consider the chronic diseases —heart disease, hemiplegia from cerebrovascular accidents, cancer, diabetes, arthritis, and the many other long-term illnesses—as inevitable concomitants of age. The former notion that these represented some mysterious "degenerative" process about which the physician could do very little is giving way to a more hopeful and a more realistic view.

In the mid-19th century physicians looked upon tuberculosis with the same fatalism we are now overcoming in respect to other chronic diseases. They called it consumption and regarded it as a "weakness of the lungs" in certain families. A member of such a family was simply fated to become ill and perhaps die at an early age because of some "constitutional" factor. We have progressed a long way in our understanding of tuberculosis. Perhaps the most significant advances were recognition that the disease could be successfully treated (at first with rest and adequate diet alone) and recognition that the disease had an external cause (a micro-organism), thus opening the path to prevention.

In the mid-20th century the view that the chronic diseases are "degenerative" has no greater justification than did the old-fashioned view of tuberculosis. True, our knowledge of some important chronic diseases is quite rudimentary; micro-organisms appear to play no role in most of them. Still, each year brings new evidence that these diseases arise out of the external conditions of life, rather than from some innate biological process itself. Thus, rheumatic heart disease is a consequence of uncontrolled infection with the Streptococcus. Lung cancer is proving to be a result of cigarette-smoking, certain occupational exposures, and perhaps other environmental factors. Abundance of food, particularly excessive caloric intake in relation to energy requirements in modern life, predisposes to hypertensive heart disease, diabetes, and other chronic diseases.

Advances of Medical Science

Medical science is extending our knowledge and ability to deal with the chronic diseases in two directions—toward better therapy and toward prevention. First, it may be appropriate to discuss newer concepts in the treatment of long-term illness from the point of

Chief, Bureau of Chronic Diseases, California State Department of Public Health.

Read in the Symposium on Progress in Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

view of a public health physician. Best known to the practicing physician are the technical advances in therapy: new drugs for hypertension and coronary heart disease; hormonal therapy for certain forms of cancer; surgical approaches to heart disease and once hopeless types of cancer; and radiation. Physical medicine in neuromuscular disease is one of the latest to gain favorable repute.

These dramatic advances have tended to dull our sensitivity to a more subtle and yet, in the long run, perhaps a more fundamental aspect of therapy. That is the combination of human support and impetus toward independence that is so much needed by long-term patients. This idea may be illustrated by the all too frequent case of an elderly person suffering from hemiplegia following a cerebrovascular accident. Without family or others to express personal interest in his recovery, he lies for months and even years in a bed on the ward of a public hospital. There are thousands of such patients lying about the wards of hospitals and custodial facilities of this country. In times gone by we have neglected them in our hurry to apply new, dramatic treatment to other patients whose outlook seemed more hopeful. At least the issue in acute disease is decided more quickly.

Now from hospital after hospital come reports that many of these formerly neglected patients on the back wards are being started on the path to substantial improvement. What seems most important in this new trend is the expression of real interest in the patients by physicians, nurses, attendants, and others around them. The fact that somebody really wants and expects them to get better, simple as this sounds, appears to be the critical element in the situation. Technical devices, physical therapy, and other improvements are helpful. But those with the greatest experience in tackling the back wards of our hospitals assert that the attitude of professional personnel is what often makes the difference between the patient who sinks into a vegetative existence and the patient who recovers sparkle in the eye and movement of limbs. A spirit of rehabilitation infused into a staff group even by a single physician may achieve remarkable results; this has been demonstrated over and over again. Patients who have been lying around for years are stimulated and helped to achieve independence in self-care, to leave the hospital, and even to return to work. Every measure of improvement is useful, not only in a better life for the individual but also in less need for attendant care.

Probably more important is that patients with conditions that might readily become debilitating, in the institutions where the new patterns of care prevail, are turned toward recovery before they have been carried down to a passive existence. Patients with hemiplegia, to use the same example again, start activity within a few days after the cerebrovascular accident, if the vascular condition appears reasonably stabilized. An attitude of overprotectiveness, expressed in the prescription of weeks of inactivity, may be harmful rather than therapeutic in this, as in many other chronic diseases.

One factor that may have accounted for our former neglect of such patients was the tremendous burden of acute illness such as otitis media, typhoid fever, pneumonia, and the corresponding emphasis on the episodic aspect of medical practice. We were inclined to concentrate on the patient's acute condition and what could be done about it with surgery, drugs, or other relatively quick therapy. Medical schools taught us to pay prime attention to the question, "What is the patient's complaint?" In chronic disease the most important question often is, "What kind of a person is this?" In acute disease the physician enters the patient's life for a brief period and may help turn the tide; in chronic disease the physician must enter the patient's life for an indefinite period and help to sustain the patient through ebb and tide, again and again.

As our ability to deal with episodic acute disease has progressed, paradoxically the burden of illness seems to have grown. But now it is chronic in nature. Accordingly medical practice must change and is changing. Medical education is beginning to reflect the new responsibilities of physicians to give long-term support and guidance to patients and their families. Some schools, for example, now assign the medical student early in his career the task of overseeing the health of a family for two or three years. This provides him with insight into the course of chronic illness and the role of the family in it.

New Concept of Family Physician

From this concern about chronic illness and the response of medical education is emerging a new concept of the family physician. The term family physician is taking on an expanded meaning from its former use to designate the physician on the back country road with the little black bag. The new idea of family physician grows out of recognition that the family should be the strongest support in a patient's struggle against disease, especially chronic disease. Actually the family may play a positive or a negative role. It may provide the affection and hope needed to overcome long-term illness. But unfortunately the family sometimes contributes to the patient's trouble. Many chronic conditions, such as hypertension, obesity, and alcoholism appear to "run in families." Although the hereditary aspects of these conditions are not fully understood, evidence is piling up that these conditions reflect the life of the family rather than some genetic process.

It thus becomes the job of the physician to deal with these problems on a family, rather than on a purely individual, basis. Insight into these subtle family relationships and how they can be strengthened to aid the patient is a most important task of the physician in dealing with chronic illness. Not all patients have families. Or the families may not from their own resources—financial, educational, moral, and other—be able to provide the support needed by the patient. Here the physician must look to the community for assistance.

Community Resources

Most communities have developed a variety of services to assist the physician in dealing with chronically ill patients. Health departments should be mentioned

first. Like practicing physicians, health officers are finding that chronic illness looms more and more prominent in the health of the community. So health departments are beginning to reorient their public health nursing, nutrition, laboratory, health education, statistical and social services to meet this paramount health need. While these professional services are still far from being sufficiently developed, physicians in many communities will find substantial help in their health departments in caring for chronically ill patients. Physicians who have patients in need of home nursing care, specialized diets, or social services will often get expert assistance from health departments. Even though the local health department may not be able to provide the service directly, members of the staff can assist the physician in finding needed help for his patients in other resources in the community. Also, the health officer may be in a position to assist physicians and others in the community concerned with such problems to develop necessary services, whether they ultimately come under public or private auspices.

Most big cities of the United States have visiting nurse associations which are increasingly responding to calls from physicians for bedside care of chronically ill patients. Bedside care is usually a key element in care of the long-term patient at home, and physicians who refer to the visiting nurse association will often achieve a substantial benefit for their patients. Some communities have undertaken more fully organized home care services. Generally these provide for medical supervision, bedside nursing care, social service, and specialized professional skills such as nutrition, laboratory, and physical therapy as needed. This pattern of organized home care services is developing rapidly over the country as a means of providing adequate care for the patient. It is based upon use of family resources and community professional services without the expense of building hospital beds. Physicians will want to keep in close touch with such developments in their own communities.

Also as an aid to the physician, several communities are forming organizations known as central services for the chronically ill, chronic illness service centers, or similar designations. These keep current information as to where needed services can be obtained in the community, whether these be hospital, nursing home, custodial, or home care services. Thus, communities are beginning to establish a whole range of services that offer practical assistance to the physician in his care of chronically ill patients. It therefore seems appropriate to direct the attention of practicing physicians to the resources that are now becoming available—community resources upon which the physician may draw for concrete help in solving his patients' problems.

Prevention

Now to consider the prevention of chronic illness. As with any disease problem, the ultimate hope for control lies in prevention. Until the past few years, the medical profession (including that segment in public health) has taken a rather dim view of the possibility of preventing much chronic disease. In 1951 the Commission on Chronic Illness, supported by the American Medical Association, the American Public Health Association, the American Hospital Association, the American Public Welfare Association, and many other organizations concerned with health, sponsored the National Conference on Chronic Disease: Preventive Aspects. From that conference, the commission assembled and subsequently published a substantial body of knowledge with practical application to the prevention of chronic disease. It served as a rallying point for a new attack on the problem.

Out of the conference came the concept that the prevention of chronic disease includes two phases: primary and secondary. Primary prevention means to avoid the occurrence of disease entirely, for example, by occupational hygiene to prevent the development of silicosis. Secondary prevention means to halt or retard the progression of disease into disability and premature death through early detection and adequate treatment. These concepts can be illustrated with specific examples indicating how recently acquired knowledge about the prevention of chronic disease may be incorporated into the everyday practice of the physician.

Primary.—Primary prevention of heart disease is a reality, particularly as a result of understanding the infectious origin of some forms of heart disease. Congenital defects of the heart and great vessels, as well as other organs, are caused in part at least by rubella during the first few months of pregnancy. Cases of heart disease following diphtheria and syphilis, fairly common only a few decades ago, are becoming rare as a result of effective means for the control of these infections. Rheumatic heart disease is declining rapidly with the widespread attack on streptococcic infection through use of penicillin. Rheumatic fever is a familial disease, repetitive episodes being likely to occur in any member of a family where the disease has once appeared, unless streptococcic infection is rigorously controlled. Hence, the primary prevention of rheumatic heart disease requires maintenance doses of penicillin for the child with the disease and prompt suppression of streptococcic infection whenever it occurs, especially among siblings of such a child. Recent decades have brought a sharp decline in cardiovascular disease due to infectious agents. Present knowledge if effectively applied should lead within a few years to practical cessation of new cases. The occurrence of diphtheria or smallpox in an American community today produces a sense of shame in the health officer and other physicians. How soon will the same be true of rheumatic fever?

When one turns to other forms of heart disease, the outlook for primary prevention is not so favorable. However, even in respect to hypertensive and arteriosclerotic cardiovascular disease, progress may be noted. Three factors associated with the hypertensive disease process offer the physician some possibility of dealing with the problem on a preventive basis: a definite familial tendency, obesity, and a characteristic personality pattern. Of these, obesity presents the clearest relationship and opportunity for preventive

action. Obesity is not only highly correlated with morbidity and mortality from hypertension but reduction of weight in the obese-hypertensive patient usually results in a corresponding drop of blood pressure. It appears reasonable that maintenance of optimum weight, especially where a familial tendency to hypertension is known, will help keep the blood pressure at a more normal level.

Control of obesity, now our nation's principal nutritional fault, would contribute to a reduction in not only hypertensive heart disease but also diabetes and other chronic diseases. If there is any one factor that runs through the gamut of chronic disease in America today, it is that as a people we have upset nature's balance between food intake and energy output. To restore a proper balance in the individual person is often difficult. Hence, we need to stress the maintenance of optimum weight from childhood on. For patients who present long-standing obesity, the physician may find his own efforts strengthened by using nutrition consultation from local health departments or other community agencies and by referring patients to weight-reduction groups that are springing up in many communities. These groups appear to offer obese patients some of the same benefit that alcoholic patients derive from Alcoholics Anonymous. Knowledge of how to prevent arteriosclerotic heart disease, while still quite meager, may increase during the next few years through the rigorous pursuit of several currently prominent hypotheses, such as excessive consumption of fats or calories generally, too little physical exercise, anxiety and other psychic factors, and cigarette-smoking.

Next to cardiovascular disease, cancer causes the greatest mortality in the United States today. The mystery of malignant neoplastic growths, however, is also beginning to yield, with ever-increasing evidence that some of the most important forms of cancer are due to environmental conditions. It has long been generally accepted that excessive sunlight induces skin cancer in light-complexioned persons, that exposure to certain dyes may cause bladder cancer, and that the old "chimney sweeps'" cancer of the scrotum developed because of exposure to soot. Now epidemiologists are finding that radiologists and the survivors of atomic bombing are dying at an excessively high rate from leukemia; that cigarette-smoking, certain occupations, and perhaps other factors cause lung cancer; and that many occupational exposures to carcinogenic agents may have been overlooked in this country.

In the current situation with respect to primary prevention of cancer, the physician has two responsibilities. The first is to note the relationship of environmental factors, especially occupational exposure, to cancer in his patients and to report his observations. This area of knowledge is developing rapidly now, but perhaps not rapidly enough to keep pace with the introduction of new physical and chemical agents into our working and living environments. The second responsibility, of course, is to apply the present knowledge of how to prevent the occurrence of cancer. For the industrial physician concerned with the health hazards of the work place this has a clear meaning—control the environment. For the physician in general practice the problem is more complex. What shall he advise his patients now as to cigarette-smoking or to x-ray treatment of lymphoid tissue? Each physician will of course want to examine the evidence and come to his own decision. In respect to cigarette-smoking and lung cancer, the conviction is growing—based on cogent evidence—that we should strongly caution young people against the danger of the habit.

Secondary.—There are other examples of primary prevention of chronic disease made possible by recent advances in our understanding of their causes. In the present state of knowledge, however, secondary prevention is an even more practical approach to the problem for most physicians. Diabetes may serve as a good illustration. Here is a disease which meant death a generation ago when it occurred in severe form. Nowadays the patient with diabetes, no matter how severe, when it is discovered early and controlled adequately, possesses an almost normal life expectancy. The problem is to find the cases early and assure continuous, good medical supervision. Means for the detection of diabetes are constantly being refined; yet there appears to be a lag in their general use. For example, reliance upon a fasting urine specimen for screening purposes is still too common, considering the evidence that many cases will be missed without a blood sugar test. A simple, reliable, and inexpensive blood sugar test is now available—the Wilkerson-Heftmann test. It requires only a drop of blood, from fingertips or vein, and can be performed on an individual basis in the physician's office or on a mass scale. It is estimated that about a million Americans have diabetes and know it; another million have the disease but do not know it because it has never been detected. Here is a marvelous opportunity for preventive medicine—find the million undiscovered cases of diabetes and by proper care prevent the vast amount of blindness, infection, and other disability and premature death that will otherwise occur.

This same concept of secondary prevention through early detection may be applied through appropriate use of the chest x-ray not only for tuberculosis but also for lung cancer; the cytological test for cancer (Papanicolaou smear) in cancer of the cervix; the tonometry test for glaucoma; and in many other ways. Systematic application to apparently well adults of devices for early detection of important chronic diseases promises to be one of the most beneficial advances in the modern practice of preventive medicine. With proper use of screening tests in examining 1,000 adults of appropriate age and sex distribution, one may expect to discover the following numbers of cases of previously unrecognized disease: diabetes, 10; glaucoma, 20; cancer of the cervix, 3; obesity, 100; hypertension, 15; and visual defect due to refractive error, 50; and an occasional case of anemia, tuberculosis, lung cancer, rheumatic heart disease, or other chronic condition. All of these are diseases for which the physician can undertake treatment in the hope of accomplishing substantial good.

The American people are becoming aware of the possibilities inherent in this aspect of preventive medicine. Newspapers and popular magazines carry stories about the annual detection drive of the American

Diabetes Association, "G-days" for glaucoma detection, the mass attack on cancer of the cervix through screening more than 100,000 women in Memphis, Tenn., and the many other successful ventures in early discovery of chronic disease. Labor unions, with renewed interest in health because of health and welfare funds, are anxious to take advantage of every opportunity that will help to avoid disability and premature death for their members.

One method of accomplishing secondary prevention on a sizable scale, with economy and efficiency, is through multiphasic screening. This is the application of a battery of screening tests (including chest x-ray, blood tests for diabetes and anemia, height and weight determination, cytological test for cancer, visual acuity, and tonometry) to large groups of apparently well individuals. All persons with test results suggestive of some abnormality are referred to their own physicians for necessary diagnostic and follow-up care. In multiphasic screening projects with eight or more tests, this means that over half the apparently well persons screened will be advised to consult their physician for a specific reason, as well as for general health maintenance care. Experience has repeatedly shown that most people will respond favorably to this appeal, whereas they do not respond so well to general advice to "see your physician for a health checkup."

Multiphasic screening projects have been conducted successfully by health departments, voluntary health agencies, county medical societies, industrial medical services, labor unions, and other agencies. Fundamental to success, of course, is the understanding and participation of the medical profession in the community. Multiphasic screening, like other new ventures in the organization of health service, has encountered a certain amount of misunderstanding. But as its principles become better known, and experience with it evaluated, it appears likely to become an important feature of modern preventive medical practice, one in which the practicing physician will play an ever more prominent role.

In all of this interest and activity it appears that a new type of health maintenance program is emerging —a type for all adults that may take its place alongside the achievements of the past few decades in health maintenance during maternity and infancy. One may indulge in semantic arguments about whether it is all "true preventive medicine" or not. But the facts remain that it is feasible; that the public is beginning to understand and want it, and therefore in a democratic society will get it; that the medical profession carries a substantial responsibility for its proper development; and that it will reduce the burden of ill health upon our people.

2151 Berkeley Way (4).

IMPACT OF MODERN THERAPY ON TUBERCULOSIS

James J. Waring, M.D., Denver

In simple terms: How are we getting along in our campaign to control tuberculosis? If we are accomplishing good, as undoubtedly is the case, what are the evidences? And, why are we doing good? There is an ever-varying reservoir of infected persons, reactors to tuberculin if and when tested. In infancy, some of these reactors, recent converters, will develop one or more of the fatal forms of postprimary tuberculosis, e. g., tuberculous meningitis, miliary tuberculosis, progressive pulmonary tuberculosis, or other forms of postprimary tuberculosis, including the extrathoracic complications. At any age, recent converters may shortly develop clinical tuberculosis. In the main, however, clinical disease will appear in those who became infected at some previous unknown, indefinite time, perhaps years before a tuberculin test was done. Recently, Professor Debré of the University of Paris said that in France 12% of school children infected at age 7 will develop manifest tuberculosis before the age of 20. The younger the child, the greater the risk, and the sooner the onset of clinical disease after infection. The risk is particularly great when first infection occurs at puberty.

Shirley Ferebee and Carroll Palmer, in the U. S. Public Health Service studies of tuberculosis, found that in school children in Puerto Rico three-fourths and in Georgia four-fifths of clinical tuberculosis developed subsequently among the "positive reactors." Obviously some of these reactors must have been recently infected. Palmer in his three-year study of 69,000 Navy recruits after induction found only 10% to be reactors, but the subsequent morbidity rate per 100,000 person-years was 20 for the nonreactors and 132, or more than six times as much, for the reactors.

Infected persons with active disease, especially those with advanced pulmonary tuberculosis, are potent

• *The reservoir of infection from which new cases of tuberculosis spring is not decreasing as it should, and the spectacular decline in mortality in recent years has not been accompanied by a proportionate decline in morbidity. The tuberculous population is kept nearly constant, despite recoveries, by new cases and by a formidable number of relapses. Patients treated at home with antibiotics sometimes reach the sanatorium later after developing a resistant strain of the infecting organism.*

The new chemotherapeutic drugs have brought about an astonishing reduction of toxic symptoms in the patient, decreasing need for bed rest, improved outlook for surgery, prevention or cure of lethal forms of the disease in childhood, and many other benefits. It is still necessary, however, to direct every effort to the drying up of the pool of infection from which the new cases come.

Professor of Medicine, Emeritus, University of Colorado School of Medicine, and President, the Colorado Foundation for Research in Tuberculosis.

Read in the Symposium on Progress in Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

spreaders of tubercle bacilli and therefore make up the "pool of communicable disease." Sooner or later, some die and pass dolorously out of the pool; others make perfect everlasting recovery and also pass, but joyfully, out of the pool. Many make apparently good arrest but sooner or later relapse. Others make what we have called "good chronics" and neither die nor get well but remain for a long time more or less able-bodied or crippled, but potentially intermittent spreaders of disease.

According to reports,[1] in some countries patients with relapses comprise a large proportion of the additions to the group of persons with open pulmonary tuberculosis. In the United States, relapses are reported in about 115,000 cases per year. An increase in the number of these relapses began about 1948, shortly after the estimated date for the beginning of the chemotherapeutic era. It is possible that a relation will be found between an increased number of relapses and the bacterial resistance that appears during the course of antimicrobial treatment, especially inexpert antimicrobial treatment. Ickert [1a] says: "The discrepancy between the trends in the curves of mortality and morbidity and in particular the gradually increasing number of relapses, dampens our hopes of continued success in the fight against tuberculosis."

In brief, the volume of the "pool of communicable disease" (infectors) is constantly increased by new victims from among the reactors; it is reduced by those who pass out to recovery or death; it is increased by those with relapses. The great feeders of this pool are the new victims from the reservoir of reactors and those with relapses from the inactive group. The total number of "infector" cases, old and new, is estimated to be three or four times the new cases reported during the same period. All our efforts should be directed at "drying-up" this pool.

Criteria of Success

What are the criteria for estimating success in our campaign? The best indexes of the prevalence of tuberculosis are the prevalence of infection, morbidity reports, and mortality records.

Prevalence of Infection.—As estimated by the tuberculin test, this index is unreliable since doctors are not using the test to the greatest advantage. Figures furnished Drolet [2] by the surgeon general of the U. S. Navy for the incidence of infection with tuberculosis among one million naval inductees, white and Negro, in 1952 showed about 10% to be reactors; in 1953, 5.3% were reactors; and, in 1954, 4.6% were reactors. Comparative figures for service inductees in the British Isles show 66% to be reactors among 3,500 servicemen between 18 and 20 years of age. According to Teague (1952), the incidence of reactors to old tuberculin (first test) of children aged 16 years in three Philadelphia high schools tested at 10-year intervals fell from 84% in 1929 to 43% in 1939, and to 16% in 1949. Pope and Gordon's [3] figures for grade school children in Massachusetts show the same remarkable decline. The reaction rate dropped from 28% in 1924 to 14% in 1939, and to 2% in 1955. As they say, "If these figures are representative, there certainly is no lag in the rate of decline of infection compared with the mortality rate in this country."

Morbidity Report.—Regulations requiring notification of open cases of tuberculosis exist in about 50 countries, but because physicians neglect to register their cases, these morbidity records are imperfect. Between 15 and 20% of all cases in the United States are first reported on death certificates. In 1953 in the United States over 5,000 cases of tuberculosis were reported for the first time on death certificates. Records for England and Wales in 1950 show that about 15% of persons who died of tuberculosis were not known to public health authorities. In Germany for the same year the corresponding figure was 10%. Between 1947 and 1953 for the United States, Canada, France, and Germany, the decline in morbidity was little more than half the decline in mortality.

Mortality Records.—Mortality statistics are most reliable, but they do not run parallel with morbidity. According to Dr. James E. Perkins, managing director of the National Tuberculosis Association, the spectacular decline of the tuberculosis death rate, 53% since 1950, began to slow down in 1954. Since 1950 the annual incidence rate, the number of new cases per 100,000 population reported each year, has fallen only 20% (table 1). It is quite possible that greater effectiveness of diagnosis largely due to mass x-ray surveys and more experience at the level of the general practitioner has uncovered a lot of previously unsuspected tuberculosis, "new cases," but this does not represent a real increase in morbidity.

TABLE 1.—*Tuberculosis in the United States—Yesterday*

			Decrease, %
	1947	1953	1947-1953
Mortality 100,000 population	33	12	64
Morbidity, new cases	135,000	107,000	21
			Decrease, %
Infection, tuberculin test reactors	1947, %	1954, %	1947-1954
New York children, 15 yr. old	28	12	57
U. S. Navy recruits	9-11	4.6	54

Since 1948 it has been reliably reported from different parts of the world that the recent decline in mortality from tuberculosis has not been invariably accompanied by a simultaneous decrease in tuberculosis morbidity. Authenticated figures show a greater decline in death rate than in case rate between 1947 and 1953 for the United States, England, Wales, Norway and Sweden, France, and New Zealand.

According to Perkins,[4] in 1954 for the first time in several years the prevalence of tuberculosis as estimated by the number of known active cases in this country at any one time, that is, the volume of the "pool of communicability," decreased slightly. Although the tuberculosis case fatality rate is much reduced, the incidence of new cases and the percentage of cases going on to complete cure have not declined in proportion. Also the number of relapses is still formidable; therefore, the total number of active and inactive cases requiring medical supervision, the "pool of possible communicable disease" as now reported, is not decreasing as it should and doubtless will.

Now, it is an uncontested fact that, for very many years, almost all over the world the death rate from tuberculosis has been steadily declining. Roughly, in 1900 in the United States it was almost 200 per 100,000 population and in 1945, just before the

"chemotherapeutic era," about 40 per 100,000 population. (In 1954 it was 10.) According to Drolet,[2] between 1930 and 1940 in 30 different countries the decline in the death rate from tuberculosis averaged almost 25%, while between 1947 and 1953 the decline in the death rate in the same countries exceeded 60%.

We can say that the previously recorded steady decline in number of persons infected, as estimated by the tuberculin test, and since 1947 the reduction in number of those dying of tuberculosis have been dramatically accelerated. Without doubt, earlier diagnoses, chemotherapy, improved anesthetics, more and better surgeons, organized health education, and generally improved living conditions are largely responsible for these dramatic changes (table 2). From the

TABLE 2.—*Tuberculosis in the United States—Today*

50 million infected
400,000 active cases
Of these, 150,000 not identified
100,000 new cases, 1955
800,000 with inactive cases
"Secondary chronics" current problem
Deaths, 1955, about 15,000
Every half-hour, one person dies

epidemiological standpoint, it seems clear that susceptibility to infection with the tubercle bacillus is general, but susceptibility to tuberculous disease is individual!

Problem of Control

Although the "miracle drugs" have radically changed for the better the treatment of tuberculosis, they have at the same time greatly magnified the problem of its control. Tuberculosis has been converted from a "killer" to a "crippler"! Tuberculosis is less and less a mortality problem and more and more a morbidity problem! The dead "lunger" no longer spits tubercle bacilli, but the "lunger," inadequately cured by the miracle drugs with or without surgery, remains alive and potentially a spreader of disease. From the 1954 report of the subcommittee on epidemiology of the International Union Against Tuberculosis, I gather that in recent years, since the general use of antibiotic drugs, relapses have been observed in increasing numbers.

If the new drugs are most effectively used, cures will be increased, early and minimal disease will be cured before it becomes advanced disease, relapses will be infrequent, the number of infectors will shrink, and, consequently and coincidentally, the number of infected, the chief feeder of the "pool of communicability," will decrease. On the contrary, if the new drugs are not expertly handled, lives will be saved but not so many, incomplete cures will be frequent, chronic disease due to "resistant" bacilli will be more common, relapses will be frequent, and the "pool of communicability" may overflow! As Perkins [4] puts it: "Has death from tuberculosis merely been postponed, not prevented, for a number of patients?"

Formerly, the tuberculosis sanatorium served three most useful functions, as an isolation hospital, a treatment hospital, and a training school, where the patient learned from other patients as well as staff doctors and nurses all about tuberculosis, how to get well, how to stay well, and how to protect friends and relatives. Will the "flight from the sanatorium," the closing of sanatorium doors, a much exaggerated affair, by the way, turn loose in the homes and on the streets a horde of uninstructed, incompletely cured "lungers" spitting resistant tubercle bacilli? The pool of contagious cases with positive sputum may increase in numbers, but the average of infectiousness be diminished or increased depending upon the incidence and the menace of resistant bacilli. In other words, we may have more people spitting fewer tubercle bacilli, whereas formerly we had fewer people each spitting more tubercle bacilli. It is too early to appraise the epidemiological significance of resistant or attenuated tubercle bacilli, made so by adequate or inadequate chemotherapy. How many will spit resistant bacilli? Will contacts of these infected persons develop a form of tuberculosis quite unresponsive to chemotherapy? Time will tell! At present, we can say that home care and outpatient clinic supervision are now permissible and practical provided an experienced physician keeps in close touch with a cooperative patient.

A tremendous medical and public health responsibility is now devolving upon the general practitioner, the public health nurse, city, county, and state health departments, and voluntary health organizations. Since we may, I emphasize may, find it advisable to treat with chemotherapy the recent converter of the tuberculin test, under some if not all circumstances, and since most clinical tuberculosis will appear among the reactors, the general practitioner must learn to use the tuberculin test wisely! He must learn the limitations of the physical examination of the chest, clinging to its advantages; he must learn fluoroscopy and the advantages and shortcomings of the chest roentgenogram; he must learn the indications for surgery; and he must learn the fast-changing methods of using the miracle drugs, since inept prescription may cost the patient his able-bodiedness, if not his life. Patients with active disease originally treated with chemotherapy by experienced sanatorium physicians usually do well. Today an alarming number of patients with active disease caused by resistant tubercle bacilli, originally inadequately treated outside the sanatorium, are now being dumped on the front doorsteps of the sanatoriums. These patients often do not do well with further chemotherapy, nor in these instances is surgery as successful as it should be. Finally, the general practitioner must never forget that, if he uses home treatment of the tuberculous person, he carries a heavy public health responsibility of continuous supervision, not only of his patient but of other members of the family. In other words, he must not only cure his patient but protect the family and neighbors against infection.

Some of the immediate practical benefits of chemotherapy may be listed as follows: 1. An astonishing reduction in toxic symptoms and a corresponding improvement in well-being and morale of the individual patient. 2. A decreasing necessity for prolonged bedrest, with consequent improvement in morale of the patient. 3. Rapid preparation for necessary surgery

and a great reduction in surgical risk. 4. A rapid reduction in cough and expectoration and the conversion of sputum from positive to negative. (The public health importance of this cannot be overestimated.) 5. The prompt reversal of progressive disease to regressive with consequent limitation or prevention of irreversible damage to the lung with its inevitable prolongation of infectiousness and invalidism. 6. The prevention or cure of lethal forms of the disease in infancy and early childhood. 7. A reduction in the size of the "pool of communicability" by the cure of early tuberculosis before it becomes advanced disease. 8. A further reduction in the reservoir of infection, already in progress many years, reducing the desirability of mass BCG vaccination, although it will not affect in specific instances the need for the protection of highly exposed persons, e.g., infants in tuberculous families. 9. Opening of the thorax to the surgeon and the pathologist and so indirectly to the physician, who now finds it possible to correlate more reliably early as well as late pathological changes with symptoms and with prognosis with or without surgery and chemotherapy.

The success of the "miracle drugs" in the treatment of tuberculosis has had other more or less unexpected but highly important results. It has stimulated study of the metabolism of the tubercle bacillus; cell metabolism; virulence; host resistance, natural and acquired; bacterial resistance; latent infections (bacterial and viral); and bacterial genetics and the search for other antimicrobials, not only against the tubercle bacillus but against other agents pathogenic for man. It has enormously stimulated the overlapping basic sciences of bacteriology, microbiology, biochemistry, pathology, and pharmacology.

2125 Hawthorne Pl. (6).

References

1. (*a*) Ickert, R.: Epidemiological Report on Tuberculosis, Bull. Internat. Union Against Tuberc. **24**: 4 (Jan.-April) 1954. (*b*) Blanco Rodriguez, F.: Changes in Control of Tuberculosis as Result of Modern Therapy, ibid. **24**: 303 (July-Oct.) 1954.

2. Drolet, G. J., and Lowell, A. M.: Where to Tuberculosis? First 7 Years of Antimicrobial Era, Am. Rev. Tuberc. **72**: 419-452 (Oct.) 1955.

3. Pope, A. S., and Gordon, J. E.: Impact of Tuberculosis on Human Populations, Am. J. M. Sc. **230**: 317-353 (Sept.) 1955.

4. Perkins, J. E.: Annual Report, NTA, 1954-1955, New York, National Tuberculosis Association, 1955.

HEALTH AS AN INSTRUMENT OF INTERNATIONAL POLICY

Harold S. Diehl, M.D., Minneapolis

• *Human health can be used as an instrument for fostering either good will or hatred on an international scale. Examples of the misuse of medical science in the recent past are the demoralization of nations with drugs like heroin and the spreading of accusations about bacteriological warfare.*

The constructive use of human health in foreign policy is exemplified in the work of the American Red Cross Commission in Poland after World War I, the Foreign Operations Administration organized by the American government in 1950, the World Health Organization, and the World Medical Association. In places where poverty, ignorance, illness, and hopelessness prevail, the rehabilitation even of one poor crippled man is understood and appreciated. It is important that physicians understand and participate in these efforts to help people and promote international good will.

The subject that I wish to discuss with you briefly is one that on first thought may seem remote from your immediate interests and concern. Yet, in these days of a rapidly shrinking world with international and intercontinental travel a matter of hours, health has come to have implications of far greater scope than most of us realize. My first glimpse of this came after World War I when, following my discharge from the United States Army in France, I joined the American Red Cross Commission to Poland and spent a year and a half in that country helping to reconstruct the health and medical facilities of a nation that had been devastated by more than four years of war with the passage back and forth across the country of gigantic armies, each of which considered the country as hostile territory. Our work was concerned with the organization of food kitchens and medical aid stations along the frontiers; with the reequipping and in many instances reorganization of hospitals; with the development of preventive services for the control of typhoid fever, malaria, smallpox, typhus, dysentery, and even cholera; and with the organization of institutions to care for thousands of children who during the war years had become orphans or had become lost and separated from their parents. We worked with national and local government officials, with church and other voluntary local groups.

This was an effort of a voluntary organization, the American Red Cross, but the deep appreciation of the Polish people to the American people for this help was expressed not only by the Polish government but also by local groups and by individual little people everywhere. In fact, the faces of the people were more eloquent expressions of their feelings of gratitude than any words written or spoken could possibly have been. To me more than 30 years ago this seemed to be an effective method of building international understanding and international good will.

From the University of Minnesota Medical School.

Read in the Symposium on Preventive Medicine, Los Angeles Midwinter Medical Convention, Jan. 4, 1956.

Exploitation of Health as Foreign Policy

In more recent years the exploitation of health has been utilized as an instrument of foreign policy by certain governments. I refer to the practice of the

Japanese during the war years of forcing opium and heroin upon the Korean and Chinese people until many became addicted to these drugs. From then on they were degraded victims of their conquerors, who controlled the supply of the drugs to which they had become slaves. Today the Communists are carrying on a similar practice in several countries of the Far East. The purpose of this illicit traffic is to obtain money, strategic materials, and the demoralization of the people of the free world.

In a report in May of last year Dr. H. J. Anslinger,[1] United States representative on the United Nations Commission on Narcotic Drugs, stated:

> Traffic in morphine and heroin from the Communist Regime of Mainland China is increasing . . . and within the past year several Southeastern Asian and other free countries have assumed a place of equal importance with Korea and Japan as places where these drugs are furnished directly by Communist agents in the traffic.

Still another fiendish method of exploiting health as an instrument of international policy has been the utterly false propaganda directed against the United States in regard to the alleged use of bacteriological warfare in Korea. To refresh your minds concerning this, I quote from the statement by Dr. Charles W. Mayo before the Political Committee of the United Nations.

> This charge of bacteriological warfare was first launched in 1951 by the North Korean Communist regime, but it received little attention from other world Communist propaganda agencies until February, 1952, when the same charge suddenly emerged as the number one theme of world Communist propaganda, culminating in a charge by the Soviet representative before the United Nations General Assembly.

These charges were categorically denied by the Secretary of State and the Secretary of Defense of the United States, by the Secretary General of the United Nations, and by the commander in chief of the United Nations Command in Korea. However, Dr. Mayo continued:

> In March and again in June of 1952 the United States brought these charges before the United Nations Security Council and requested that a committee of the International Red Cross, with the aid of scientists of international reputation, investigate the charge and report upon it to the Security Council as soon as possible. The Soviet Union used its veto to block such impartial investigation. Then in October, 1952, the United States requested the General Assembly of the United Nations to place on its agenda an item calling for an impartial investigation of charges that United States and United Nations Forces in Korea were utilizing bacteriological warfare. Such resolution was adopted by the Assembly in April, 1953.
>
> In the year and a half after the United Nations General Assembly authorized the investigation of these charges by an impartial commission, the opposition and the failure to cooperate on the part of the North Korean and Chinese Communists blocked the functioning of this committee, clearly implying that they did not wish such an investigation.
>
> During this period the Soviet Union transmitted to the United Nations for circulation to all delegates a document entitled "Report of the International Scientific Commission for the Investigation of Facts Concerning Bacteriological Warfare in China and Korea." The report of this commission, which was composed mainly of well-known communist collaborators, placed great emphasis upon the handwritten confessions of four United States Air Force officers. The appearance of these four officers before the so-called Scientific Commission was the climax of the communist propaganda film issued in several languages—English, French, and Spanish—and given world-wide distribution.

After the release of these Air Force officers and other American prisoners it was learned that these confessions had been obtained by torture, bribery, and other well-established communist techniques. The final appraisal of this propaganda campaign, as expressed by Dr. Mayo, states:

> It now clearly appears that the entire germ warfare propaganda drive was developed to give expression for broad communist policies concerning the conduct of the Korean aggression, the purpose being to discredit the United States in the eyes of the free world and thus to help to isolate it from its allies.

Constructive Use of Health in Foreign Policy

After this dismal story of the exploitation of health for political purposes, let us turn to a brighter and far different side of the picture. I refer to the manner in which our own government in recent years has been using health as an instrument of foreign policy, a policy that has been carried out primarily through two major agencies with which it has been my privilege to have some contact. These agencies are the Foreign Operations Administration and the World Health Organization. The decision of our government, particularly the State Department, to promote better health services and better health conditions in many and remote areas of the world, has been based upon the obvious facts that communism, the sworn enemy of our democratic way of life, finds its most favorable soil for growth and development under conditions where the people live in poverty, ignorance, illness, and hopelessness. David Key,[2] in a Department of State bulletin, wrote:

> From time immemorial most of mankind has been diseased, hungry, and poorly housed. For six out of ten human beings, in fact, for nine out of ten in many economically undeveloped areas—these remain the normal conditions of life today. As a result, the stability of half of the world is based on a vicious social and economical cycle. Poor health means lower productivity; lower productivity means lower standards of living; lower standards of living mean less food, less education and poorer living conditions; these in turn mean poor health. Thus the cycle of misery is completed.

The government of the United States is attempting to break this cycle by assisting the underdeveloped and underprivileged countries of the free world to raise the standards of living for their citizens. From the very beginning the improvement of health has been one of the major goals. The agencies through which our government has channeled most of its support for the improvement of health in the less developed regions of the world are the Foreign Operations Administration and WHO.

Foreign Operations Administration

The Foreign Operations Administration was an agency of our government that developed, carried out, and supported programs to aid other countries on a so-called bilateral basis; that is, on the basis of programs that were formulated, subscribed to, and participated in by the government of the United States and the government of the other country concerned. A substantial beginning in this type of program was made by the so-called Marshall Plan, the Point Four Program, and the Economic Cooperation Administration. These agencies were the forerunners of the

stronger, better organized, more adequately supported and more comprehensive Foreign Operations Administration. This agency was established by Congress to operate for the five-year period that ended June 30, 1955. The job to be done, however, was not yet completed; therefore, as of July 1 of the same year Congress continued these activities under a new division of the State Department known as the International Cooperation Administration.

The programs of the Foreign Operations Administration covered economic, industrial, scientific, education, and social welfare activities as well as health activities. It is the latter, however, with which we are particularly concerned. That our government considers this of major importance is apparent from the fact that last year some 40 million U. S. dollars were expended for health purposes through this agency, and several times that amount by the governments of the countries assisted. Most of these programs were in the less well-developed countries of the world: in South and Southeast Asia, the Near East, Africa, Latin America, and Southeastern Europe. In these regions more than twice as many people live as live in the better developed regions of North America, Western and Southern Europe, Australia, and Japan.

The types of programs supported by this agency include practically all aspects of health and medical services. First priority, however, has been given to programs, the results of which are rapid, recognizable, and appreciated, and affect large numbers of people at low cost per person—so low that the host country can practically always take over the maintenance job. Specifically these programs include (1) mass campaigns against malaria and yaws and against nutritional deficiencies, such as beriberi, xeropthalmia, and goiter; (2) development of safe community water supplies; (3) demonstration through health centers of services on a community-wide basis, such as sanitation, communicable disease control, health records and statistics, home visiting, maternal and child health, nutrition, health education, and laboratory and general clinical service; (4) advice and assistance in strengthening and stabilizing the organization and operation of official public health services of the government; (5) advice and assistance in planning and designing of hospitals, health centers, laboratories, and other health facilities; (6) development and support of the basic training of personnel for service in public health; (7) the development of medical schools, including the provision of training for key medical school teachers, the provision of necessary supplies and equipment, and advisory and consultant services from schools in this country; (8) mass campaigns against other diseases of major importance, such as trachoma, smallpox, typhus, leprosy, and tuberculosis; (9) consultation on sanitary engineering or other specialized services; and (10) special projects, such as demonstration health centers and medical rehabilitation programs.[a]

One might raise a question as to whether certain of these projects that reach a relatively few individuals, such as rehabilitation, are justified, when the health needs of the entire population are so colossal. There is, however, an aspect of this with which I was greatly impressed in Mexico last spring. That is the impact that these personalized services make upon the common people. I refer particularly to a rehabilitation program that our government is helping to support and direct in Mexico. This program reaches but a small percentage of the numbers of people who are being benefited by programs for improved sanitation and nutrition and for the prevention of such diseases as malaria, intestinal infections, and tuberculosis. On the other hand, important as they are, major preventive public health services are little understood or appreciated by the poor, uneducated people who make up the vast majority of the population of that country. These people do understand, however, and appreciate what is being done when they see a poor crippled man from their village rehabilitated so that he can lead an active, useful, dignified, and happy life. I was deeply impressed with the value of such services in the cold war for men's minds and hearts in which we are engaged.

World Health Organization

The other major agency through which our government is working for the improvement of health on a world-wide basis is WHO. This organization is a technical agency in the field of health, set up by the governments of the world, within the general orbit of the United Nations, yet administratively independent of the United Nations. It has a membership of 84 nations, of which all but nine "Iron Curtain countries" are active supporters of and participants in the work of the organization. WHO is concerned with the development and the improvement of sound and effective public health services in the nations of the world. The policy-forming body of WHO is the World Health Assembly, which meets annually and is composed of delegates from the member governments. It was my privilege to serve as a member of the United States delegation to the seventh World Health Assembly held in Geneva, Switzerland, in 1954; and to the eighth World Health Assembly held in Mexico City, Mexico, in May of last year. It is a thrilling and most impressive experience to see the representatives of the nations of the world, irrespective of race, color, language, religion, or social and economic status, meet together to discuss problems and programs of world health.

In its relatively short existence WHO has established international services of great value, such as the compilation and dissemination of information concerning the prevalence of epidemic diseases and the development of international standards for biological preparations—services that can be provided only by an intergovernmental health agency. It has also exercised leadership in the world-wide control of malaria, a disease that has long been of first importance in many countries of the world but which is now rapidly disappearing from the globe. In fact, the last World Health Assembly considered proposals for the total eradication of malaria on a global scale. Other accomplishments of WHO have been leadership and direction in mass control of yaws in the Caribbean area, in Southeast Asia, and in Africa; the issuance of reports of technical committees of international experts on a wide range of subjects, such as mental health, nurs-

ing, environmental sanitation, influenza, and plague; and the training through fellowship grants of some 2,000 special persons in the field of health from countries that do not have the facilities for such training. In addition, the last World Health Assembly gave consideration to the role of WHO in the new international program to develop the peaceful uses of atomic energy. As Key [2] states:

> The staff of the World Health Organization is composed of 700 health experts from 50 countries, including about 100 from the United States. These individuals are sharing common tasks and common interests and are working together toward common objectives. They learn to understand each other's viewpoints and to live harmoniously in a world which technology has shrunk so that we all are neighbors.
>
> WHO staff members, whether at headquarters or on field projects, are likewise becoming acquainted with the peoples they are helping and are identifying themselves with the needs of these peoples. This becomes a two-way process, as the villager, the farmer, and the artisan of the economically underdeveloped areas of the world are discovering that cooperative international action can achieve tangible benefits for them in their own lives.
>
> In this connection I cannot resist retelling a pertinent story about the World Health Organization, which is known in many parts of the world as "WHO." An Indian doctor, working on malaria control in a remote village in northern Thailand, asked the local headman a few questions. Had he heard of Mr. Nehru? "No." Had he heard of President Eisenhower? "No." Had he heard of WHO? "Oh, yes. Mr. WHO is the man who sprayed my house, and we have no more sick babies—a very good man." This incident, which could be multiplied many times over, illustrates how the work of the World Health Organization gets to the grass roots and effectively helps the common man.

At the World Health Assembly in Mexico City last May, the Minister of Foreign Affairs of Mexico, speaking "in the name of the President of the Republic, and in the name of the entire population of Mexico," stated:

> Twentieth century man after the dreadful experience of two world wars, is striving to create a peaceful world! Yet, how can we hope to achieve a universal political equilibrium when more than half of humanity is still victim to plagues which science has vanished in the laboratory but not in fact among the peoples? A world cannot aspire to be called civilized until such time as the aid of science and modern techniques are put into service on a universal scale for the health of man. That man is not an abstract idea. He is flesh and bone reality. In devoting your efforts and ideas to him you are laying the foundation of universal peace, for man's health is the foundation of the social edifice, the workshop of the world rests on his shoulders.

These sentiments of the Foreign Minister of Mexico were echoed by Mr. Adlai Stevenson in an address at the dedication of the New York University Medical Science Building last June, when he said: "Healing, like music, is a bridge between races and nations. The secrets of life-giving, unlike those of death dealing, can be made humanity's possession, binding the giver and the receiver ever closer together."

Under the leadership of President Eisenhower, the last session of the Congress of the United States reaffirmed its support of WHO. This move is significant and encouraging but it is not enough. It is essential also that the people, and particularly the physicians and other health workers of our country, understand and maintain an active interest in and support of these programs. Physicians are needed for this work in many parts of the world, but many, many more physicians are needed to interpret these programs and their significance to the people of the United States whose support is essential if they are to succeed.

World Medical Association

So far I have discussed the governmental agencies in which physicians of the United States should have a real interest. However, I wish to mention a young international organization that is growing rapidly in membership and in influence in the field of health and medical services throughout the world. I refer to the World Medical Association. This association is the world organization of physicians as a professional group. It is the equivalent on the world scene of the American Medical Association in the United States. It is composed of medical societies of the world, with the American Medical Association playing a leading role. In addition to association memberships, it allows for personal memberships on the part of physicians through supporting committees, which now exist in several countries, including the United States. The World Medical Association, which was founded after World War II at the initiative of leaders of the profession, particularly of the United States, Canada, England, Latin America, and France, has grown in influence and importance as the voice of the physicians of the world. Annually, at its assemblies and at council meetings, it brings together leaders of organized medicine to consider the broad problems facing the physicians of the world. Among the contributions that the World Medical Association has made during its brief life are the development of the International Code of Medical Ethics, which is becoming increasingly well known as the modern Hippocratic Oath, and the sponsorship of the first World Congress on Medical Education, held in London in 1953, a meeting that has given stimulation and direction to the improvement of medical education throughout the free world. Currently it is undertaking leadership in the field of occupational health on a world-wide basis. Dr. Louis Bauer, past-president of the American Medical Association, is the executive secretary of the World Medical Association; Drs. Gunnar Gundersen and Edwin S. Hamilton, members of the Board of Trustees of the American Medical Association, are members of the council of the World Medical Association.

What Physicians Can Do

There are several things that American physicians can do to forward the work of these several teammates for health on the world scene. Every physician who is a member of the American Medical Association is entitled to individual membership in the United States committee of the World Medical Association. Support through such memberships enables the World Medical Association to carry on its important activities. With membership comes a subscription to the *World Journal of Medicine*, which gives a view of the world scene in medicine. In support of WHO, the physician should familiarize himself with its values to the United States both as an arm of the foreign policy of our government and as a contributor to our domestic health. He can assist in developing understanding within his

own community concerning the importance of the development of public health services in underdeveloped areas of the world as a barrier to the spread of communism. Information concerning these activities can be obtained from the National Citizens Committee for the World Health Organization, 1790 Broadway, New York.

Finally, health is a subject in which all people of the world, irrespective of color, race, and political philosophy, have a common interest. In fact, international cooperation in the field of health is proving to be a common ground for the development of cooperation and understanding that could well extend to more difficult and more controversial areas. This is a field in which the United States has the ability as well as the unique opportunity to assume world leadership. It is important that physicians understand and participate in these efforts. Such a participation helps protect the health of Americans at home and abroad; it furthers the progress of medicine and the medical profession throughout the world; and, probably most important of all, it is a potent force in our world-wide effort to build the conditions of peace.

References

1. Communist China and Illicit Narcotic Traffic, Hearings Before Subcommittee to Investigate Administration of Internal Security Act and Other Internal Security Laws, 84th Congress, 1st Session, March 8–May 13, 1955, Senate Judiciary Committee, Congress, 1955.
2. Key, D. McK.: World Security and the World Health Organization, Bulletin 25, Department of State, October, 1954, p. 616.
3. Hanlon, J. J.: Design of Public Health Program for Underdeveloped Countries, Pub. Health Rep. **69**: 1028-1032 (Nov.) 1954.

CLINICAL NOTES

IATROGENIC HEATSTROKE

John Chapman, M.D.
and
William B. Bean, M.D., Iowa City

Hyperpyrexia or heatstroke has been recognized for many years as a risk of workers exposed to high environmental heat loads, particularly when they fail to use available protective measures. Although heatstroke has been studied in detail along epidemiological [1] as well as physiological lines,[2] it has not been considered much of a problem in ill patients during a period of sustained heat where there are no provisions for air conditioning. When troops move suddenly into hot, dry deserts; warm, moist, jungles; or tropical conditions, particularly after the confined inactivity of a sea voyage, heat exhaustion is the usual form of heat disability. Heat exhaustion commonly is nothing more than unrecognized dehydration. Intake of water promptly corrects it. Hyperpyrexia from heat occurs when the sweat glands are worn out or overwhelmed acutely. Both problems have been studied in the natural environment as well as under experimental conditions of the laboratory.[3] In the classic study of Ferris and his colleagues in Cincinnati,[2] sustained elevation of night temperature was a more important causal factor than the height of temperature during the day. Subsequent exhaustion of the heat-regulating mechanism eventuated in the sometimes abrupt, sometimes gradual, cessation of sweating that gave rise to hyperpyrexia. This excessive elevation of body temperature presumably developed very rapidly after sweating stopped, though naturally there are no observations on the time relationship. Congestive heart failure, a traditionally invoked antecedent, was not important. The main prerequisites of heatstroke were excessively high night temperature during a protracted heat spell in which the daytime temperature was also excessively high, a breakdown of the heat-regulating mechanism characterized by cessation of sweating, and subsequent hyperpyrexia. Without prompt cooling, death usually came very quickly. Acute but not chronic alcoholism constituted an added risk.

The observation of several patients at the University Hospitals who had temperatures of 105-106 F (40.5-41.1 C) during a heat spell in 1955 illustrated some of the problems seen in industry or in movement of troops from a cool to a hot climate. In this situation, with the patients under observation, some of the prodromes and some of the unusual inciting or precipitating causes may come under more detailed analysis and observation, even if only in retrospect. The purpose of this report is to describe observations of a patient who developed hyperpyrexia after the cessation of sweating, aggravated or precipitated by the employment of atropine in preparation for a bronchoscopic examination. No doubt drapes used on such patients in the operating room impeded cooling. Restriction of fluids and the heat produced by struggling during the procedure probably represent added handicaps. Additional cases of heatstroke have occurred under similar circumstances, though in no single case has it been possible to exclude other possible precipitating agents or causes. In other cases, recognized early, patients were relieved by prompt sponging and fanning.

Report of a Case

A 64-year-old night watchman was admitted to the medical service of the State University of Iowa Hospitals on July 12, 1955. During the preceding three months he had noticed progressive shortness of breath and pain in his legs; both conditions appeared after he walked about three blocks. Both were relieved by rest. He had been taking 0.1 mg. of digitoxin daily and was receiving 2 ml. of meralluride (Mercuhydrin) weekly from his family physician for congestive heart failure. Various vasodilators had been ineffective in relieving the pain in the legs. In 1947 the patient had received radiation for carcinoma of the right vocal cord. He had been observed periodically here in the otolaryngology clinic from 1947 to 1953 with no evidence found of recurrent carcinoma. He also had been evaluated in the medical outpatient clinic, where hypertensive cardiovascular disease with congestive failure was discovered. The patient's wife later informed the examiners that her husband was "one-quarter Cherokee Indian." There were no other significant data except that one son with cirrhosis of the liver had bled from esophageal varices.

Review of systems disclosed that the patient had been in other hospitals four times since November, 1954, because of "pneumonia." During the six weeks prior to his admission here, he had several attacks of unexplained chills and fever. For several weeks he had raised much white sputum every morning

From the Department of Medicine and the University Hospitals of the College of Medicine, State University of Iowa.

without hemoptysis. He habitually smoked one package of cigarettes and drank 10 cans of beer daily. There were no gastrointestinal, genitourinary, or neurological complaints.

Physical examination showed a squat, cooperative, gray-haired man with a very protuberant abdomen. Blood pressure was 140/90 mm. Hg, pulse rate 80, and respirations 24. His voice had been hoarse since the radiation of the larynx. The skin was grayish-brown, and there was acne on the abdomen and back. Findings on examination of the head, eyes, ears, nose, and throat were not remarkable. An ill-defined mass 1 cm. in diameter was palpable in the right supraclavicular area. The chest was "barrel-shaped" and somewhat emphysematous. Expiratory wheezes and fine rales were heard over both lungs. The heart was slightly enlarged to the left. A grade 1 apical systolic murmur was heard. A small amount of ascites was present. A firm, elevated erythematous mass half a centimeter in diameter was discovered in the foreskin. The ankles had slight pitting edema.

Specific gravity of the urine was 1.011; neither albumin nor sugar was found, but several hyline casts were seen microscopically. The hemoglobin level was 10.5 gm. per 100 cc., and the white blood cell count was 10,900 per cubic millimeter, with 3 bands, 82 granulocytes, 1 eosinophil, 7 lymphocytes, and 7 monocytes. Findings of the Kolmer serologic test were reported "positive 1:1," while results of the Venereal Disease Research Laboratory test were "doubtful." Results were "doubtful" when both tests were repeated. The cerebrospinal fluid was negative. Because of the apparent increased pigmentation, the urine was examined for presence of arsenic, mercury, and lead, but these were not found. The result of the test for coproporphyrin was 2+ and that for uroporphyrin was negative. Frei and tuberculin skin tests were negative. Electrocardiographic findings were normal. Total vital capacity was 1.8 liters. No L.E. cells were found. Blood cultures failed to grow Brucella or other organisms. Findings of tests indicating status of the liver were sulfobromophthalein, 9% retention; albumin, 4.3 mg.; and globulin, 3.4 mg. per 100 cc.; thymol turbidity, 4.9 units per 100 cc.; alkaline phosphatase, 3.4 Bodansky units per 100 cc.; and total cholesterol, 207 mg., and esters, 170 mg. per 100 cc. Chest x-ray demonstrated left ventricular hypertrophy and an unsuspected density 4 cm. in diameter in the right lower lobe. This was thought to represent a bronchogenic carcinoma. X-ray films of sinuses revealed pansinusitis.

The patient received 800 mg. of sodium in his diet and 0.15 mg. of digitoxin daily, and on July 14 he was given 2 ml. of meralluride intramuscularly. By July 27 he had lost 13 lb. of edematous fluid. During this period he had several episodes of chills and mild fever for which no cause was found. The palpable node above the right clavicle was removed on July 27. Taking of fluids was restricted from midnight of July 26 until biopsy was completed late the following morning. The operation was well tolerated. Histological examination of the specimen revealed no carcinoma. On the day following the biopsy, the patient was examined by bronchoscopy. The administration of orally given fluids was again restricted after midnight. As premedication he received 50 mg. of pentobarbital sodium at 7:30 a. m. and 50 mg. of meperidine (Demerol) hydrochloride with 0.2 mg. of atropine at 8:30 a. m. At 8 a. m. 400 cc. of 5% glucose in water was given intravenously. Bronchoscopy was difficult, but visualization of the tracheobronchial tree was adequate. The only abnormality seen was evidence of chronic bronchitis. Cells obtained by bronchial washings were reported as "suspicious—several cells exhibiting aberrant activity." A culture grew beta-hemolytic streptococci and Diplococcus pneumoniae.

After returning to the ward at 1 p. m., the patient ate part of his lunch. An hour later he was unusually restless. When examined by the ward resident he was restless, confused, and tachypneic, with an inspiratory stridor. Blood pressure was 160/80 mm. Hg, pulse rate 100, and rectal temperature 101.8 F (38.8 C). The skin was hot and dry. An intravenous infusion of 5% glucose in water was started, and oxygen was given by nasal catheter. During the next hour, he lapsed into coma. The rectal temperature when rechecked was over 109 F (42.8 C). Because of the hyperpyrexia he was sponged with alcohol and ice while a tub of ice was prepared. Rectal temperature after several minutes of vigorous sponging was 108.2 F (42.3 C) with a different thermometer. The patient was put in a tub of ice water and massaged until the temperature dropped to 100 F (37.7 C), at which time the blood pressure was 90/40 mm. Hg. After he was removed from the tub, the temperature continued to drop. It reached a low of 95.8 F (35.4 C). Lumbar puncture later yielded clear fluid with the following levels: protein, 54 mg. per 100 cc.; glucose, 115 mg. per 100 cc.; and chloride, 120.5 mEq. per liter. Serum electrolyte values were sodium, 138 mEq.; potassium, 6.2 mEq.; chloride, 110.4 mEq.; and carbon dioxide–combining power, 18.9 mEq. per liter.

For the next few hours the patient had all the clinical signs of decerebrate rigidity. At 8:00 p. m. he began to react to painful stimuli. He vomited 200 cc. of coffee-ground material. Wangensteen suction produced dark-brown liquid during the following two hours. His hemoglobin level was now 10.5 gm. per 100 cc., and the white blood cell count was 10,900 per cubic millimeter. Granular casts and albumin were found in the urine. Whole blood (500 cc.) was given intravenously. At 10:00 p. m. the patient began to respond to questions and by the following day was fully oriented. Wangensteen suction was stopped, and he took food by mouth. On July 29, the day following the hyperpyrexia, value for blood urea nitrogen was 60 mg. per 100 cc.; creatinine, 4 mg. per 100 cc.; sodium, 131 mEq.; potassium, 3.6 mEq.; chloride, 102.6 mEq.; and carbon dioxide–combining power, 20.7 mEq. per liter.

For two days the temperature was labile and occasional alcohol sponges were necessary. Within a week he seemed restored completely to his previous physical condition and had a consistently normal temperature. He complained only of frequent "fantastic" dreams. On Aug. 9, the level of blood urea nitrogen was 15 mg. and that of creatinine 2.1 mg. per 100 cc. Pulmonary function studies done Aug. 12 suggested that the patient might tolerate a lobectomy but probably not a pneumonectomy. A right lower lobectomy was performed on Aug. 16. The mass removed was an epidermoid bronchogenic carcinoma. During operation, a branch of the pulmonary artery was torn, and transfusion of 2,500 cc. of blood was required. The immediate postoperative condition was good.

During the next four days respiratory difficulty, temperatures up to 104 F (40 C), and mental confusion developed. Penicillin, streptomycin, and intravenously given fluids were administered. On Aug. 19 there was an episode of acute gastric dilatation. A Levin tube was introduced. Suction thereafter produced dark-red fluid. Serum electrolytes were normal on Aug. 18. On Aug. 20 a medical consultant found no evidence of congestive heart failure. Blood pressure was 130/70 mm. Hg, pulse rate 100, and temperature 100.8 F (38.2 C). Respirations were shallow and labored. Subcutaneous emphysema was present over the upper chest and there were twitching movements of the face and arm muscles. The patient was moved to an air-conditioned room, where he improved temporarily. Serum electrolyte values reported later the same day were sodium, 128 mEq.; potassium, 5.1 mEq.; chloride, 76 mEq.; and carbon dioxide–combining power, 33.1 mEq. per liter. Chest x-ray film showed "almost complete expansion of the remaining right lung." There was no evidence of pneumonia. The surgical resident calculated that there were sodium and chloride deficits equivalent to 4 liters of isotonic sodium chloride solution.

At 9:50 p. m., Aug. 20, respirations ceased and the patient died. Postmortem examination findings were (1) mural thrombus of main artery and medial lobe of right lung, (2) congestion of right lung and slight bilateral pulmonary edema, (3) slight calcification of aortic valve, (4) myocardial hypertrophy, (5) chronic congestion of the liver, (6) splenomegaly, (7) mild cerebral edema, (8) moderately severe coronary atherosclerosis, (9) diffuse cortical hyperplasia of both adrenal glands, and (10) small areas of gastric submucosal hemorrhage. A culture of blood from the heart at autopsy yielded no growth.

Comment

The genesis of heatstroke is not understood with the precision that would tell us why, toward the end of a heat wave, it seizes on this patient or that rather than everybody in the hospital or nobody. The occurrence

of heatstroke in a hospital suggests a need for artificial cooling, at least in certain portions of the hospital; but, since this will not soon become widely available, it behooves us to search out what may be disposing factors and antecedents of heatstroke. A number of personal observations reveal that heatstroke has a more than chance tendency to affect (1) those who have undergone surgical operations, (2) those who have undergone procedures such as endoscopic examinations, and (3) those who may have had to go without food or drink over substantial periods of time because of intensive studies during hospitalization. It is very difficult to document such instances. The evidence, circumstantial at best, is not always convincing; such causes of heatstroke remain in the realm of probability.

In our patient we think it likely that the use of atropine favored the cessation of sweating. We are convinced that doing on successive days two procedures that required the patient's going without food or drink for many hours was a contributing cause. Such procedures are often done on patients who are snugly wrapped in the gown and ceremonial drapes of the operating table, which form an effective windscreen and reduce such cooling as convection and evaporation might bring. Finally, the tendency to shield such people from view with curtains before and after a procedure may present an added hazard. We suggest close observation of patients subjected, during a very warm spell, to such procedures when they are living in quarters that do not provide effective cooling at night or are not air conditioned. We have no evidence that procedures done in an air-conditioned operating room render persons more susceptible to heatstroke when they are removed into a hot environment. To establish these ideas on firmer ground, additional observations must be made. The mere fact that heatstroke occurs suggests that we are not taking adequate precautions, particularly under the circumstances set forth herein. Old age, congestive heart failure, and alcoholism, though discounted,[2] may have been added factors here.

Summary and Conclusions

A patient developed heatstroke soon after bronchoscopic examination. It is our opinion that the various preparations for this procedure may have precipitated his trouble. Certainly there were potentially harmful influences. We urge that further observations dealing with this problem be made, so that proper prophylaxis may be instituted if such precursors should prove to be significant in the occurrence of heatstroke in patients in general hospitals.

Newton Road (Dr. Bean).

This study was aided by the Department of Medicine Trust Fund.

References

1. Borden, D. L.; Waddill, J. F., and Grier, G. S., III: Statistical Study of 265 Cases of Heat Disease, J.A.M.A. **128**: 1200-1205 (Aug. 25) 1945. Daily, W. M., and Harrison, T. R.: Study of Mechanism and Treatment of Experimental Heat Pyrexia, Am. J. M. Sc. **215**: 42-55 (Jan.) 1948. Malamud, N.; Haymaker, W., and Custer, R. P.: Heat Stroke: Clinico-Pathologic Study of 125 Fatal Cases, Mil. Surgeon **99**: 397-449 (Nov.) 1946.

2. Ferris, E. B., Jr.; Blankenhorn, M. A.; Robinson, H. W., and Cullen, G. E.: Heat Stroke: Clinical and Chemical Observations on 44 Cases, J. Clin. Invest. **17**: 249-262 (May) 1938.

3. Bean, W. B., and Eichna, L. W.: Performance in Relation to Environmental Temperature: Reactions of Normal Young Men to Simulated Desert Environment, Fed. Proc. **2**: 144-158 (Sept.) 1943. Eichna, L. W.; Bean, W. B.; Ashe, W. F., Jr., and Nelson, N.: Performance in Relation to Environmental Temperature: Reactions of Normal Young Men to Hot, Humid (Simulated Jungle) Environment, Bull. Johns Hopkins Hosp. **76**: 25-58 (Jan.) 1945. Eichna, L. W.; Ashe, W. F., Jr.; Bean, W. B., and Shelly, W. B.: Upper Limits of Environmental Heat and Humidity Tolerated by Acclimatized Men Working in Hot Environments, J. Indust. Hyg. & Toxicol. **27**: 59-84 (March) 1945.

DETERMINATION OF RADIOIODINE UPTAKE IN THYROIDS BY TWO METHODS

Egilda DeAmicis, S.B.
and
Earle W. Williamson, B.S., Boston

There are several methods available for the determination of radioiodine (I^{131}) uptake by the thyroid gland. Some methods involve a single detector, either a scintillation counter or a Geiger-Müller tube, or four detectors, either scintillation counters or Geiger-Müller tubes. There are advantages and disadvantages in both methods. Since both a single scintillation counter and a four-tube setup are in use at the New England Deaconess Hospital, it was decided to compare the uptake of I^{131} in the thyroid gland as determined by each method. Radioiodine emits beta particles, having a maximum energy of 0.60 mev and a range in tissue of 2 to 3 mm.; the I^{131} also emits gamma rays. This isotope has a half-life of eight days. Since the I^{131} normally concentrates in the thyroid gland in varying amounts, depending on the condition of the gland, the isotope is very useful in diagnostic tests.

Procedure

The procedure as here employed is to administer the radioiodine orally, the prescribed dose being made up in a glass of water. At the same time that the patient's dose is prepared, a standard containing an amount of I^{131} equal to the dose in the patient's drink is made up in a 125-ml. Erlenmeyer flask. Twenty-four hours and 48 hours after administration of the I^{131} the patient returns to the hospital for studies of the I^{131} uptake in the thyroid gland. This uptake is determined by either the single scintillation counter or the four-Geiger-Müller-tube arrangement. In the scintillation-counter setup there is a crystal of thallium-activated sodium iodide 1 in. thick by 1 in. in diameter. The crystal has a shield consisting of an annular lead ring of approximately 0.38-in. thickness mounted in a chrome-plated brass shell. The crystal is the detecting element, which fluoresces when radiation impinges on it; the fluorescent light is converted into electrical impulses by the photomultiplier tube. Finally, the electrical impulses are amplified and energize a scaling unit.

Prior to the determination of the count rate of I^{131}, a count rate of the background, i. e., the radiation due to cosmic rays and any other radiation in the vicinity, is established. Since the background radiation may not be eliminated, it is necessary to subtract its count rate from the count rates of I^{131}; all count rates are corrected in this manner. Prior to the determination of

From the Cancer Research Institute, New England Deaconess Hospital.

the count rate of I^{131} in the patient's thyroid gland, the count rate of the previously prepared standard is determined. When the scintillation counter is used for determining the I^{131} uptake, a distance of 30 cm. from the face of the crystal to the center of the standard is employed. The count rate of the standard when taken under these conditions is considered the 100% value.

After the establishment of this value, the patient is positioned in a chair so that the distance from the face of the scintillation crystal to the skin at the isthmus level of the thyroid is 30 cm. With the single-scintillation-counter method, the patient can be allowed little movement, and alignment of the patient becomes very important. The distance of 30 cm. was selected for the scintillation-counter setup because minor errors in positioning and alignment or slight motion of the patient will not affect the percentage of uptake as greatly as when a shorter distance is used. The count rate of the I^{131} in the thyroid is established. This count rate divided by the count rate previously established for the standard multiplied by 100 gives the percentage of uptake in the thyroid.

The count rates of the standard and thyroid are then obtained by the four-tube setup.[1] The copper-cathode Geiger-Müller tubes are connected in parallel and register as one on the scaler. The Geiger-Müller tubes are arranged on the circumference of a circle having a radius of 45 cm., the tubes being located at 90, 180, 270, and 360 degrees. Concentric within this circle is one of smaller radius, 7.5 cm., which is termed "free circle"; the function of the "free circle" is to present an area in which the count rate varies less than 5% from the count rate obtained at the center of the circle. With such an arrangement the patient may move about or be inaccurately positioned within the limits of the "free circle" and the count rate will not change appreciably. With this method the patient sits in an adjustable chair that can be elevated until the level of the thyroid gland is in the same plane as the four tubes. When the patient is properly positioned, a count rate of the iodine in the thyroid is established. Prior to the reading of the uptake in a patient, the count rate of the previously prepared standard is established, so that the percentage uptake of I^{131} in the thyroid can be obtained.

Results and Statistical Analysis

Since both the single-scintillation-counter method and the four-tube-Geiger-Müller setup were available, many patients having tracer doses of I^{131} had the percentage of uptake of I^{131} in the thyroid gland established by both methods. This paper presents the data on 55 patients whose percentage of uptake has been determined by both methods. The table gives the percentages of uptake established at 24 and 48 hours by both the scintillation-counter technique and the four-tube setup; also presented are the differences in percentage of uptake between these two methods. A statistical analysis of the data by an adaptation of the "t" test[2] to insure validity and significance of the results shows that the differences exhibited between the 24-hour and the 48-hour uptake readings on the same subject performed within a 30-minute interval on the four-tube-Geiger-Müller setup and on the scintillation-tube arrangement are in very close agreement with each other, the differences exhibited being well within the limits of chance variation. From the data, it is possible to conclude that both methods give reasonable estimates of some true value, or that the scintillation arrangement approximates the "true" four-tube-Geiger-Müller value.

The determination of the percentages of uptake is performed in such a manner as to preclude bias due to different persons participating, due to the order in which the methods are used, or due to the radiation level being measured. The differences (table) between readings with the single-scintillation-counter arrangement and four-tube-Geiger-Müller-tube setup are approximately half positive and half negative, indicating that neither method reads consistently higher or lower than the other. The 24-hour readings for the four-tube-Geiger-Müller setup are higher a few more times than those for the scintillation-counter arrangement, but with the readings taken at 48 hours the reverse is true. With the exception of three readings in the 24-hour series, all readings were ±8% or lower, while at 48 hours all but two values were ±7.3% or lower. Three of these large differences could be explained on the basis of known factors, such as an uncooperative patient and bandages over the thyroid area, preventing

Percentage of Difference in Uptake of I ^{131} by Two Methods

Case No.	24 Hr. Uptake, %			48-Hr. Uptake, %		
	4 Geiger-Mueller Tubes	Scintillation Counter	Difference in Uptakes, %	4 Geiger-Mueller Tubes	Scintillation Counter	Difference in Uptakes, %
1	87.0	90.0	−3.0	80.0	79.0	1.0
2	40.5	44.0	−3.5	42.0	47.0	−5.0
3	22.8	21.8	1.0	21.8	20.0	1.8
4	75.5	69.5	6.0	73.0	70.5	2.5
5	33.6	36.0	−2.4	30.0	33.0	−3.0
6	76.0	70.0	6.0	71.0	66.0	5.0
7	76.3	73.6	2.7	71.0	74.0	−3.0
8	64.6	66.6	−2.0	....	....	...
9	42.0	41.0	1.0	39.0	44.0	−5.0
10	72.5	80.0	−7.5	72.0	70.0	2.0
11	58.2	42.5	15.7	....	....	...
12	20.0	21.0	−1.0	....	....	...
13	31.4	29.6	1.8	....	....	...
14	76.0	61.0	15.0	66.5	68.0	−1.5
15	37.0	29.2	7.8	28.8	31.6	−2.8
16	30.2	30.0	0.2	27.3	29.0	−1.7
17	66.5	68.0	−1.5	58.5	64.5	−6.0
18	16.3	13.3	3.6	....	....	...
19	67.0	63.0	4.0	....	....	...
20	57.5	57.5	0.0	....	....	...
21	54.5	57.5	−2.5	50.7	53.6	−2.9
22	....	....	...	96.0	84.0	12.0
23	69.0	70.0	−1.0	65.0	61.5	3.5
24	29.0	31.0	−2.0	24.2	27.0	−2.8
25	60.0	66.0	−6.0	51.0	51.0	0.0
26	30.0	33.5	−3.5	31.0	30.0	1.0
27	22.8	18.6	4.2	14.8	16.6	−1.8
28	31.0	31.0	0.0	29.6	30.0	−0.4
29	21.8	22.0	−0.2	20.0	21.0	−1.0
30	39.8	41.0	−1.2	33.6	33.0	0.6
31	28.8	28.3	0.5	23.5	23.6	−0.1
32	43.6	41.0	2.6	34.8	36.5	−1.7
33	57.0	58.9	−1.9	58.6	58.6	0.0
34	....	....	...	81.5	82.5	−1.0
35	44.6	42.4	2.2	42.2	42.4	−0.2
36	61.6	65.2	−3.2	....	....	...
37	76.0	79.4	−3.4	75.4	75.5	−0.1
38	44.5	44.5	0.0	43.6	44.2	−0.6
39	42.0	38.1	3.9	40.1	35.2	5.2
40	57.5	64.0	−6.5	57.5	66.0	−8.5
41	32.6	29.6	3.0	32.4	37.6	−5.2
42	83.0	72.5	10.5	....	....	...
43	61.0	64.8	−3.8	....	....	...
44	23.3	24.0	−0.7	24.1	21.8	2.3
45	86.0	79.5	6.5	80.0	80.0	0.0
46	34.6	37.2	−2.6	....	....	...
47	90.5	82.5	8.0	....	....	...
48	14.7	12.5	2.2	7.0	9.0	−2.0
49	42.0	41.0	1.0	43.7	38.0	5.7
50	42.0	40.0	2.0	43.3	36.0	7.3
51	36.6	36.6	0.0	37.4	39.0	−1.6
52	100.0	100.0	0.0	97.5	104.0 *	−6.5
53	43.7	38.0	5.7	46.7	43.2	3.5
54	44.4	48.6	−4.2	54.0	47.5	6.5
55	36.6	34.4	2.2	....	....	...

* This value is possibly due to movement of patient.

proper distance measurement. These extreme differences were not eliminated in determining whether the two series were in agreement. If they had been, an even stronger agreement between the two methods would have resulted.

As has previously been mentioned, each counting method has certain advantages and disadvantages. Patient positioning and movement have already been discussed. The sensitivity of each method must be evaluated. The scintillation counter is approximately five times as sensitive as the Geiger-Müller-tube arrangement; the diagnostic dose of I^{131} (50 μc) may be considerably reduced if the scintillation counter is employed. The low sensitivity of the four-Geiger-Müller-tube setup has an advantage when one is determining the percentage of uptake in patients who have received therapeutic doses (5,000 μc, or 5 mc.). When one attempts to determine the uptake in those patients who have received a therapeutic dose, the scintillation method is inadequate, due to the large amount of coincidence and resolving losses. Very ill patients may not be able to step into the adjustable dental chair of the four-Geiger-Müller-tube setup, whereas they may easily sit before the scintillation counter; the latter may be mounted on a cart and can be taken to the room of the nonambulatory patient.

Radioiodine in Urine

In the study of some patients who have been administered doses of I^{131}, it is helpful to determine the I^{131} in the urine. With the four-Geiger-Müller-tube arrangement the radioactivity of the total collection may be measured because of the "free circle" region, where the count rate will not change appreciably with varying volumes of urine. The low sensitivity of the setup also makes it possible to determine the I^{131} in the total collection of urine of patients who have received therapeutic doses. With the single-scintillation-counter setup, it is necessary to take an aliquot of urine because the detecting crystal may not "see" the total volume of urine; in patients receiving I^{131} therapy an aliquot of the total urine collection would be taken for measurement because of the high sensitivity of the scintillation counter and the attendant coincidence and resolving losses.

Addendum

Since these data were compiled, our scintillation counter has been modified by the manufacturer. Following this modification, we now find that correction factors ranging from 1.0 to 1.3 must be applied to the scintillation counter readings in order to have a comparison of the uptakes.

194 Pilgrim Rd. (15) (Miss DeAmicis).

This investigation was supported by a contract with the Atomic Energy Commission.

All radioiodine employed in this investigation was obtained from the Oak Ridge National Laboratories.

Mr. Russell F. Cowing gave advice and suggestions in this study, and Miss Dorothy Blanchard gave technical assistance.

References

1. Freedberg, A. S.; Ureles, A. L.; VanDilla, M., and McManus, M. J.: A New Simple Method for Accurate Measurement of Urinary I^{131} After Tracer and Therapeutic Doses, J. Clin. Endocrinol. **10**: 437 (April) 1950. Freedberg, A. S.; Chamovitz, D. L.; Ureles, A. L., and VanDilla, M. A.: The Direct Measurement of I^{131} Uptake in the Thyroid Gland: Further Observations, ibid. **10**: 910 (Aug.) 1950.

2. Youden, W. J.: Statistical Methods for Chemists, New York, John Wiley & Sons, Inc., 1951, p. 28.

ANAPHYLAXIS TO HEPARIN SODIUM

REPORT OF A CASE, WITH IMMUNOLOGIC STUDIES

I. Leonard Bernstein, M.D., Chicago

Although minor manifestations of sensitivity to heparin sodium have been encountered in the early clinical usage of heparin therapy, reports of heparin anaphylaxis did not appear until 1946. The present report deals with another instance of anaphylaxis to heparin in a patient with allergies to multiple inhalants. It is the eighth such case in the available literature and the fourth to be supported by skin and passive transfer tests. It is presented in order to alert the profession to the possibility of such a catastrophic event when heparin is employed.

A 71-year-old man was admitted to the hospital on May 5, 1955, with a history of substernal chest pain of 10 days' duration. The pain was oppressive in nature and radiated down both arms. Review of his history revealed the existence of long-standing seasonal rhinitis and asthma, for which he had received desensitization therapy at different periods. Physical examination disclosed a well-developed, apprehensive man with a pulse rate of 100 and a normal blood pressure. Examination of the heart was essentially normal, and the remainder of the examination was not remarkable. The sedimentation rates were elevated early in the course of his illness, and the electrocardiograms showed an evolving pattern of an anterior myocardial infarction.

TABLE 1.—*Skin and Passive Transfer Tests on Patient with Anaphylactic Reaction to Heparin*

	Antigen Dilution	Skin: Scratch	Skin: Intradermal	Passive Transfer 6/2/55: Control	Passive Transfer 7/6/55: Control
Heparin (beef)	1-1,000	0*	0	0	0	0	0
	1-100	0	++	0	0	+	0
	1-10	0	+++	++	0	+	0
	Undiluted	0	++++	++++	0	+++	0
Heparin (pork)	1-1,000	—	—	—	—	0	0
	1-100	—	—	—	—	0	0
	1-10	—	—	—	—	0	0
	Undiluted	—	—	—	—	0	0
Beef muscle	1-100	—	0	0	0	—	—
	1-10	—	0	0	0	—	—
	Undiluted	—	—	0	0	—	—
Beef serum	1-1,000	—	0	—	—	—	—
	1-100	—	0	—	—	0	0
	1-10	—	0	—	—	0	0
Pork muscle	1-1,000	—	0	—	—	—	—
	1-100	—	—	—	—	0	0
Penicillin	1-1,000	—	—	0	0	—	—
	1-100	—	—	0	0	—	—
	1-10	—	—	0	0	—	—
	Undiluted	—	—	0	0	—	—
Saline control.....		0	0	0	0	0	0

* 0, negative; —, not done; +, positive.

Soon after admission the patient was given an intravenous injection of 100 mg. of heparin. Two weeks later he developed thrombophlebitis, and he was subsequently given another intravenous injection of 50 mg. of heparin. Within three minutes there resulted an anaphylactic reaction characterized by difficult breathing, shock, cyanosis, extreme apprehension, and inaudible heart sounds. He was given 50 mg. of diphenhydramine (Benadryl) intravenously, 0.2 cc. of epinephrine solution 1:1,000 intravenously, 0.3 cc. of epinephrine subcutaneously, and oxygen by mask. He made a gradual recovery over a 30-minute period after this therapy. Fortunately, his cardiac status was not affected adversely by the anaphylactic reaction. His thrombophlebitis cleared in six days without further treatment, and the remainder of his convalescence was uneventful. After the reaction to heparin, skin tests, passive transfer tests, and other immunologic procedures were performed; these are summarized in table 1. Scratch tests with heparin were negative. Intradermal tests were

From the Veterans Administration Research Hospital and the Allergy Research Laboratory, Department of Medicine, Northwestern University Medical School. Dr. Bernstein is now in Cincinnati.

positive in a dilution of 1 to 100. Two subjects were given intradermal injections of 0.05 cc. of the patient's serum. Forty-eight hours later these sites were tested with dilutions of a heparin solution; these gave positive reactions. Similar tests were negative for pork heparin, beef muscle, beef serum, and pork muscle. In order to rule out the possibility that this reaction might have been due to the use of a syringe contaminated by a trace quantity of penicillin,[1] a passive transfer test was made with this drug; this was negative. Precipitins to heparin were absent.

Comment

Heparin is a complex polysaccharide belonging to the class of mucoitin polysulfuric esters. Most commercial preparations are prepared from beef lung, but one commercial product is derived from hog liver. Thus far it has been impossible to obtain a pure heparin substance with well-defined chemical and physiological properties. However, toxic reactions such as chills, pyrexia, headache, and lumbar aches, which were common in the early use of heparin, are no longer encountered because of progressive refinements in the manufacturing process.

De Takats[2] was the first to call attention to allergic manifestations to heparin, although none of these represented true anaphylaxis. Jorpes,[3] in a review of the Swedish literature through 1946, stated that there were four reports of anaphylactic reactions to heparin. Serious shock occurred in one of them when treatment was resumed after an initial dose one week previously. It is not known whether these cases were substantiated by skin tests or other immunologic studies. Grolnick,[4] Højensgaard,[5] and Chernoff[6] each reported a case with true anaphylactic reactions to heparin. Complete skin tests and other immunologic data were procured in these cases in an attempt to show whether this sensitivity was native to the mucopolysaccharide component or whether a species-specific factor was responsible. Hauch[7] collected six cases with allergic symptoms to heparin. He concluded that these reactions were on the basis of species-specific sensitivity because some of his subjects reacted to beef heparin and others to pork heparin.

Plancherel[8] conducted the most complete investigation of heparin sensitivity. In a study of a long-acting heparin preparation, he encountered six instances of allergic phenomena ranging from simple pruritus to periarteritis nodosa. All patients exhibited either positive results on intracutaneous tests or a fall in platelet count 30 minutes after a subcutaneous injection of heparin. The latter test was found to be just as sensitive as the skin test in cases of heparin sensitivity. By means of patch, scratch, and conjunctival tests to both beef and sheep heparin, he also studied 16 patients who had been on heparin therapy without allergic manifestations. The results of these tests were negative. In another series of 10 "nonsensitive" patients tested intradermally with beef heparin, there was one positive reaction. When this case was reevaluated, it was noted that this patient complained of a marked local reaction, with pruritus at the site of the initial heparin injection. Plancherel[8] concluded that the intracutaneous or the platelet fall tests were significant in the substantiation of heparin allergy. He also attempted to differentiate between sensitivity to the heparin compound itself or to animal protein contaminants. In a single patient, he demonstrated an isolated sensitivity to a "fraction V" heparin, one of six heparin fractions supplied by Hoffmann-LaRoche. These fractions were bioassayed by varying response on the blood clotting mechanisms and on different numbers of sulfur groups. No mention was made of protein composition of these fractions, nor were efforts made

TABLE 2.—*Summary of Reports on Heparin Sensitivity*

Author	Year	Cases, No.	Anaphylaxis	Other Allergic Manifestations	No. with Allergy History	Primary Diagnosis	No. with Previous Exposure to Heparin	Skin Tests to Beef Heparin	Skin Tests to Pork Heparin	P-K * Antibodies: Beef Heparin	P-K * Antibodies: Pork Heparin	P-K * Antibodies: Beef	P-K * Antibodies: Pork	P-K * Antibodies: Penicillin	Precipitins	Fall in Platelets
De Takats [2]	1943	8	0	Flushing of face, dyspnea, choking, constriction of chest, faintness	0	Varied	2	0	0	0	0	0	0	0	0	0
Jorpes [3]	1946	4	4	.....	—	Varied	1	—	—	—	—	—	—	—	—	—
Grolnick [4]	1947	1	1	.....	0	Subacute bacterial endocarditis	1	+	—	+	—	+	—	0	0	—
Højensgaard [5]	1949	1	1	.....	0	Pulmonary embolus	0	+	—	0	—	—	—	—	—	—
Chernoff [6]	1950	1	1	Urticaria	0	Coronary thrombosis	0	+	—	+	+	+	+	—	—	—
Hauch [7]	1952	6	0	Itching of conjunctiva and palate, rhinitis, bronchial asthma	3	Varied	—	2 cases +	4 cases +	0	—	—	—	—	0	—
Plancherel [8]	1952	6	0	Urticaria, eczema, angioneurotic edema, periarteritis nodosa, eosinophilic infiltration of heart muscle	—	Varied	3	+	—	—	—	—	—	—	—	+
Vodopivec: Deutsche med. Wchnschr. **79**: 1423 (Sept. 17) 1954	1954	5	0	Urticaria, asthma, fever, eosinophilia	—	Varied	—	—	—	+	—	—	—	—	—	—
Present case	1955	1	1	.....	1	Coronary thrombosis	1	+	—	+	0	0	0	0	0	—

* Prausnitz-Kustner (passive transfer). †—, not recorded or not done; +, positive; 0, negative

to exclude the possibility of species antigen in the testing. Complete data of the previous literature are summarized in table 2.

Skin and passive transfer studies in the case reported herein were positive for the beef heparin preparation used in this instance, while they were negative for pork heparin. Simultaneous testing with pork, beef, and beef serum antigens produced negative reactions to these substances. If it were not for a negative reaction to pork heparin, this would seem to be unequivocal evidence that, at least in this instance of heparin sensitivity, species-specific factors were not operative. In view of Plancherel's [8] previous demonstration of sensitivity to a specific fraction of heparin, the evidence in this case is in favor of sensitivity to a specific fraction of this brand of heparin that was not present in the pork heparin tested. Unfortunately, specific fractions of both brands of heparin were not available for further investigation of this problem.

This report is also illustrative of several additional facts worthy of note. Prompt and radical treatment, including epinephrine, may have been lifesaving. It was felt that the use of epinephrine was imperative despite the accepted contraindication of such medication in the course of a myocardial infarct. This patient had a clear-cut history of exogenous allergies. In retrospect it might have been wiser to make a skin test with heparin prior to the intravenous use of heparin. Both De Takats [2] and Jorpes [3] have advised the use of a smaller initial dose (10-25 mg.) in order to avoid serious reactions. Return to these early recommendations seems justified, especially when an allergic history is obtained.

Summary

A case of anaphylaxis to heparin was studied by means of direct skin and passive transfer tests; these were positive. Further studies indicated evidence of true sensitivity to heparin polysaccharide substance rather than animal protein contaminants. It is suggested that caution be exercised in the employment of heparin therapy in allergic patients.

707 Race, Cincinnati.

This paper has been reviewed in the Veterans Administration and is published with the approval of the Chief Medical Director. The opinion expressed by the author is the result of his own study and does not necessarily reflect the opinion or policy of the Veterans Administration.

References

1. Coleman, M., and Siegel, B. B.: Studies in Penicillin Hypersensitivity: II. The Significance of Penicillin as a Contaminant, J. Allergy **26**: 253-261 (May) 1955.

2. de Takats, G.: Heparin Tolerance: A Test of the Clotting Mechanism, Surg. Gynec. & Obst. **77**: 31-39 (July) 1943.

3. Jorpes, J. E.: Heparin in the Treatment of Thrombosis: An Account of Its Chemistry, Physiology and Application in Medicine, ed. 2, New York, Oxford University Press, 1946.

4. Grolnick, M., and Loewe, L.: Immunologic Studies in Patients with Subacute Bacterial Endocarditis Treated by Combined Penicillin Heparin Method: II. Report of Sensitivity to Heparin in Patient, J. Allergy **18**: 277-282 (July) 1947.

5. Højensgaard, I. C., and Schwartz, M.: Heparin Hypersensitivity, Acta allergol. **2**: 7-13 (Aug.) 1949.

6. Chernoff, A. I.: Anaphylactic Reaction Following Injection of Heparin, New England J. Med. **242**: 315-319 (March 2) 1950.

7. Hauch, E. W.; Carryer, H. M., and Mathieson, D. R.: Hypersensitivity to Heparin: Report of 3 Cases, Proc. Staff Meet. Mayo Clin. **27**: 163-166 (April 9) 1952.

8. Plancherel, P.: Klinische und gerinnungsphysiologische Untersuchungen mit einem neuen Heparindepotpräparat, Ztschr. klin. Med. **150**: 213-259 (March) 1952.

CORTICOTROPIN (ACTH) GEL IN TREATMENT OF IRRADIATION ENTEROCOLITIS

REPORT OF TWO CASES

George E. MacDonald, M.D.
and
Lyman H. Hoyt, M.D., Boston

One of the undesirable but frequently inevitable complications of radiotherapy of the lower vertebrae or abdomen for neoplastic disease is the development of enterocolitis. The intensity of the latter can vary from mild diarrhea of short duration that is readily controlled by simple medicaments such as camphorated opium tincture (paregoric) to severe diarrhea that does not respond to all the medicaments usually employed to check the inflammation and hyperperistalsis associated with enterocolitis. In a person already debilitated because of carcinoma, the maintenance of fluid and electrolyte balance is essential. Accordingly, any measure that might be taken to prevent or arrest diarrhea and its devastating effect on fluid and electrolyte balance is certainly to be desired. The following two case reports indicate the effectiveness of corticotropin (ACTH) gel in the treatment of severe diarrhea that developed after radiotherapy for carcinoma that was metastatic from the rectosigmoid to the sacrum.

CASE 1.—A 52-year-old female was admitted to the New England Deaconess Hospital on Jan. 18, 1955, because of pain in the lower back of three months' duration. In 1950 she had had an abdominoperineal resection for adenocarcinoma of the rectum, with hysterectomy and bilateral salpingo-oophorectomy because of extension into these organs. Her course subsequent to the operation was uneventful until three months before her present admission, when she developed some pain in the lower back. This gradually increased and became associated with some urinary incontinence, frequency, and nocturia. She had begun to have anorexia and had noticed that her right leg had become slightly swollen. On physical examination her temperature was 98 F (36.4 C), blood pressure 190/100 mm. Hg, pulse 84, and weight 126.5 lb. (57.4 kg.). Her appearance was that of a white, middle-aged female with a considerable loss of subcutaneous fat, which was compatible with the presence of a chronic disease. Her heart and lungs were normal. The liver edge was palpable just below the costal margin. A colostomy, which seemed to be functioning normally, was present in the left lower quadrant of the abdomen. The uterus and adnexa were absent. On vaginal examination, there was definite tenderness of the sacrum and coccyx, with firm, hard tissue fixed to these vertebrae. The urinary bladder was slightly distended. Chest x-ray examination revealed the lung fields to be clear. Examination of the spine revealed partial destruction of the sacrum, more marked on the left side. The other vertebrae appeared to be normal. The laboratory data were as follows: hemoglobin level 6.7 gm. per 100 cc.; erythrocytes 2,300,000 and leukocytes 8,900 per cubic millimeter, with a normal differential count; and nonprotein nitrogen level 115 mg. per 100 cc. Urinalysis showed specific gravity 1.008 alkaline reaction, slight trace of albumin, no sugar, no acetone, and a few erythrocytes and many leukocytes per high-power field. Pseudomonas aeruginosa and hemolytic streptococci were cultured from the urine.

Radiotherapy was begun on the day after admission and was continued through Feb. 1, 1955. The patient was given eight treatments through a 15 by 15 cm. port centered over the sacrum. The total air dose was 2,250 r, and the total dose calculated at the center of the tumor was 1,530 r. She was given three whole blood transfusions of 500 cc. Although she

From New England Deaconess Hospital.

had some anorexia at the time of admission, there was no vomiting until the ninth hospital day. At approximately this same time she began to have increasing frequency of liquid bowel movements. Because of the urinary tract infection, therapy with 1 cc. of Combiotic (a combination of penicillin and dihydrostreptomycin) given intramuscularly twice daily was begun on Feb. 8 and was continued until Feb. 14, when it was discontinued because the patient had developed generalized pruritus and a macular rash. Diphenhydramine (Benadryl), 50 mg. four times a day, and calamine lotion were used for this complication. However, the rash and pruritus persisted. The patient's appetite continued to be poor, she had occasional episodes of vomiting, and the frequency of movements from her colostomy increased despite intravenous administration of fluids and therapy with vitamins, aluminum hydroxide gel, camphorated opium tincture, and other medicaments. By Feb. 23 there was almost continuous liquid fecal drainage. This constituted a considerable nursing problem. On Feb. 23, therapy with corticotropin gel, 60 units intramuscularly daily, was begun. By Feb. 26, the rash had almost entirely cleared, colostomy drainage was under control, and the patient's appetite had increased markedly. Sixty units of corticotropin gel was given intramuscularly daily for nine days; dosage was then decreased to 40 units for three days, then 20 units for two days, and then 10 units daily. During this period the patient had developed a voracious appetite and felt well except for some discomfort in her lower back. Therapy with corticotropin was discontinued on March 19, after a total of 24 days. Cystoscopic examination was performed on March 21, and trabeculation of the bladder was found. The ureteral orifice on the right seemed higher than on the left, and the impression was gained of extrinsic spreading disease. Sodium indigotindisulfonate given intravenously did not appear from the right ureter over a 30-minute period, and there was very little, if any, peristalsis on this side. A fair amount of dye drained from the left ureter after 25 minutes. The bladder capacity was found to be 300 cc. The urologic consultant's impression was "bilateral ureteral obstruction, more marked on the right side, presumably by metastatic carcinoma."

Corticotropin gel was administered again on March 27 because of the recurrence of anorexia and nausea. Sixty units intramuscularly daily was given, with a favorable response. The dose was gradually decreased until April 18, when use of the drug was stopped because of the development of generalized edema. The patient's weight, which had been 126.5 lb. at the time of admission and which had dropped to 118 lb. (53.5 kg.) during her period of vomiting, had gradually increased to 155 lb. (70.3 kg.) during the period when her appetite was excessive, and subsequently there was a rapid weight gain to 163 lb. (74 kg.). The nonprotein nitrogen level, which had dropped from 115 to 58 mg. per 100 cc. on April 4, had gradually increased to 145 mg. by April 22. The patient became comatose and died on April 29, 1955.

At postmortem examination, she was found to have a local recurrence of carcinoma overlying the sacrum and invading it. Both ureters were also involved by tumor, with complete obstruction of the right of long standing, with associated atrophy of the right kidney. The left ureter was almost completely obstructed, and there was a marked degree of hydronephrosis on the left. The right iliac vein was partially obstructed by tumor. There was no evidence of tumor elsewhere. The intestine was reported to show no abnormalities microscopically. Nodular hyperplasia of both adrenal glands was present, the right weighing 10.2 gm. and the left 12.3 gm. The pituitary was of normal contour and weighed 1.05 gm.

The interesting feature of this case was the marked improvement in appetite, feeling of well-being, and the cessation of diarrhea when corticotropin gel was employed. Although the patient did have azotemia throughout her hospital stay, she had no diarrhea until after radiotherapy. The time interval between the beginning of radiotherapy and the onset of diarrhea also suggested that the irradiation was the causative factor. The diarrhea stopped promptly when corticotropin was given. This impression was corroborated by the case that follows.

Case 2.—This patient was readmitted to the New England Deaconess Hospital on Feb. 20, 1955. In March, 1952, he had been found to have an adenocarcinoma of the rectosigmoid. At that time, an anterior resection with a transverse colostomy was performed. Microscopically, the lesion was found to be 7 cm. proximal to the distal line of resection, and there were two negative lymph nodes. Second admission was on July 14, 1952, when the colostomy was excised and an end-to-end anastomosis performed. Third admission was on March 12, 1954, because of evidence of recurrence of carcinoma at the site of anastomosis. An abdominoperineal resection was performed. The surgeon believed that he had not been able to remove all the diseased tissue adherent to the sacrum, and the pathological examination confirmed this impression. Fourth admission was on Dec. 30, 1954, because of acute urinary retention. A transurethral resection for benign prostatic hypertrophy was performed on Jan. 6, 1955, and the patient was discharged on Jan. 16, 1955. Prior to and during this admission he had, in addition to the urinary retention, considerable back pain, which was assumed to be caused by metastatic disease. An intravenous urogram revealed normal function of both kidneys, but the bladder dome was described as being somewhat ragged and its base considerably elevated. The irregularity of the dome was thought to be due to extrinsic disease, while the elevation of the base was thought due to prostatic enlargement. X-ray examination of the pelvis and lumbosacral vertebrae failed to reveal any evidence of destructive changes.

Radiotherapy was begun on Jan. 4, 1955, and was continued during the next month for a total air dose of 7,670 r through a port measuring 10 by 16 cm., with rotation of the pelvis. The calculated dose in the center of rotation was 2,900 r. On Jan. 23 the patient was unable to void and use of an indwelling catheter was necessary. Reexamination by the urologist revealed the presence of a stricture of the meatus, and dilatation was done. During the patient's course of radiotherapy and continuing to the time of readmission on Feb. 20, 1955, he had resistant diarrhea from his colostomy that failed to respond to camphorated opium tincture, opium tincture, aluminum hydroxide gel, codeine, and other medicaments. Associated with the diarrhea he had considerable anorexia and slight vomiting. His weight was 160 lb. (72.6 kg.) on admission. Therapy with corticotropin gel, 60 units intramuscularly daily, was begun, and within three days diarrhea was completely under control and the patient's appetite had increased considerably. The dosage of corticotropin gel was gradually decreased to 20 units intramuscularly daily, and the patient was discharged on March 10, 1955, to continue receiving this at home. He continued to be free of symptoms during the following month, and the dosage of corticotropin was gradually decreased to 10 units twice weekly and finally discontinued. However, the patient became slightly depressed, and his appetite and food intake decreased. On May 11, 1955, corticotropin gel was given again, and its use has been continued in a dosage of 40 units twice weekly. At the present time the patient is free of any genitourinary, gastrointestinal, or back symptoms; has an excellent appetite; weighs 175 lb. (79.4 kg.); and is in good spirits.

At the time of his most recent admission to the hospital, this patient's chief problem was that of diarrhea, which in the presence of a normal nonprotein nitrogen level was thought to be secondary to radiotherapy to his back. This had failed to respond to the usual measures. There was a prompt and very gratifying response to corticotropin gel, not only from the point of view of controlling diarrhea and increasing appetite but also from the aspect of improving the patient's outlook and bringing about a feeling of well-being.

Comment

We doubt that the underlying malignancy was affected by corticotropin in either of these two cases. However, the dramatic relief from nausea and diarrhea given by corticotropin gel made these patients much more comfortable, and indeed a mild euphoria devel-

oped that was most helpful. Although detailed electrolyte-balance studies were not performed in either case, it is obvious that there was a negative balance during the patients' periods of nausea and diarrhea. In a patient already debilitated by malignant disease and its complications, these additional factors in themselves could easily accelerate the inevitable outcome. In our own experience and in that of others,[1] corticotropin has been of value in the treatment of certain types of enteritis and colitis. Corticotropin seems to be equally effective in controlling the acute gastrointestinal symptoms that can follow radiotherapy.

Summary

In two cases of recurrent adenocarcinoma of the rectosigmoid colon with vertebral metastases, the patients developed nausea, vomiting, and diarrhea after radiotherapy. The use of corticotropin (ACTH) gel provided prompt relief for these distressing complicating side-effects. The associated mild euphoria that resulted was also a helpful feature in caring for these patients.

Bay State Road (15) (Dr. MacDonald).

References

1. Elliott, J. M., and Giansiracusa, J. E.: ACTH and Cortisone in the Treatment of Ulcerative Colitis: An Evaluation of Their Prolonged Administration, New England J. Med. **250**: 969-976, 1954. Elliott, J. M.; Kiefer, E. D., and Hurxthal, L. M.: Symposium on ACTH and Cortisone as Related to Gastrointestinal Tract: ACTH in the Treatment of Chronic Ulcerative Colitis, Gastroenterology **19**: 722-728, 1951. Gray, S. J.; Reifenstein, R. W., and Benson, J.: ACTH Therapy in Ulcerative Colitis and Regional Enteritis, New England J. Med. **245**: 481-487, 1951. Kirsner, J. B., and Palmer, W. L.: Ulcerative Colitis: Considerations of Its Etiology and Treatment, J. A. M. A. **155**: 341-346 (May 22) 1954.

COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

Monographs and supplemental statements on drugs that appear in this column have been authorized by the Council for publication and inclusion in New and Nonofficial Remedies. They are based upon the evaluation of available scientific data and reports of investigations.

H. D. KAUTZ, M.D., *Secretary.*

Antivenin (Crotalidae) Polyvalent.—North and South American Antisnakebite Serum.—An antitoxin obtained from the serum of horses that have been immunized with the venom of four crotaline snakes (C. atrox, C. adamanteus, C. durissus terrificus, and B. atrox). The antivenin, dried by vacuum dehydration from the frozen state, retains its potency for at least five years and is readily soluble in water for injection. It is standardized by its ability to neutralize the toxic action of a standard venom by concomitant intravenous injection into mice.

Actions and Uses.—Antivenin (crotalidae) polyvalent contains protective substances against the venom of certain crotaline snakes (pit vipers) as demonstrated by its ability to neutralize the toxic effects of supralethal doses of venom injected into mice. Crotaline venoms against which it is theoretically protective in man include those of most of the common pit vipers of North and South America, such as the rattlesnake, moccasin, copperhead, fer-de-lance, tropical rattler, cantil, and bushmaster. Because of known variations in venom antigenicity among various species of the family crotalidae, it is not known whether the serum contains protective substances against the venoms of all pit vipers. Since it would be almost impossible to obtain extensive clinical evidence with the antivenin in persons bitten by snakes, and since the serum is lifesaving in mice, it is a proper presumption that it will be beneficial in the treatment of human victims of crotaline snake bite. The drug is of no value for the neutralization of venom following bites inflicted by noncrotaline snakes such as the American coral snake, the true vipers, including the puff adder, the cobras, and the mamba, or any of the venomous spiders or scorpions.

While antivenin (crotalidae) polyvalent is considered useful in the treatment of envenomization, its administration ordinarily should follow the use of well-established emergency first-aid procedures. These include the immediate application of a tourniquet, not too tightly applied when an extremity is involved, and incision and suction at the site of the bite. When a tourniquet is used, periodic release is necessary to avoid gangrene. When such emergency measures have been delayed too long to make them useful, antivenin should be considered the initial method of therapy. Chemical freezing, as with ethyl chloride, or prolonged exposure to cold, as by immersion in ice water, should be avoided because of the likelihood that this enhances the hypoxic condition caused by the hemorrhagic and proteolytic snake venoms. In cases of potentially fatal bites by large snakes, experiments with animals indicate that life can always be saved at the cost of a limb by quick application of a tight tourniquet and subsequent amputation.

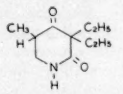
Dosage.—Antivenin (crotalidae) polyvalent is administered subcutaneously, intramuscularly, or intravenously in doses of 10 to 50 cc. of reconstituted serum, depending on severity of symptoms, lapse of time after bite, size of snake, and size of patient (the smaller the body of the victim in relation to the size of the snake, the larger the dose required). The freeze-dried serum should be reconstituted immediately prior to use. Preliminary intradermal and conjunctival tests for sensitivity to horse serum should be carried out before administration of the antivenin if there is a history of allergy. If desensitization is not required, the estimated dose is administered by separate injections, not to exceed 10 cc. at any one site. If the victim is treated within two hours, a small quantity of the serum may be injected around the wound (except for bites on the digits); otherwise the entire dose should be administered higher on the bitten limb. The initial dose is the most important one, since viper venoms rapidly break down blood vessels and thus impede systemic absorption of the serum; therefore, the initial dose should be large enough to saturate the system and overwhelm the toxin. If symptoms such as swelling or pain persist or recur, additional doses may be injected every 30 minutes to 2 hours, as necessary. Although the serum frequently may be administered

by laymen as an emergency procedure, it should not be given intravenously except by a physician and then only in grave cases. All patients should be hospitalized if possible, and blood typing for transfusion should be performed as soon as possible because alteration of the blood pattern by the venom soon may make accurate cross-matching impossible.

Preparations for use as stated for the foregoing drug are marketed under the following name: Antivenin (Crotalidae) Polyvalent.

Wyeth Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of antivenin (crotalidae) polyvalent.

Methyprylon.—3, 3-Diethyl-5-methyl-2, 4-piperidinedione.—The structural formula of methyprylon may be represented as follows:



Actions and Uses.—Methyprylon, a piperidine derivative, is chemically unrelated to the barbiturates but depresses the central nervous system in a similar manner. The drug possesses a wide margin of safety and exerts pronounced hypnotic effects but has less tendency to produce respiratory depression than barbiturates. The onset and duration of its action are comparable to those of such short-acting barbiturates as secobarbital sodium and pentobarbital sodium. The possibility of addicting properties after long-term administration has not been fully assessed, but present clinical information indicates this to be less likely than with the barbituric acid derivatives.

Methyprylon is useful as a hypnotic in patients with simple and nervous insomnia. Although it is not superior to the barbiturates in this respect, it is well accepted by patients and appears to approximate the hypnotic potency of the usual doses of secobarbital sodium or pentobarbital sodium. Thus, its soporific action begins shortly after administration and generally lasts several hours. In most patients, this is sufficient to induce a restful night's sleep.

The ultimate usefulness of methyprylon as a tranquilizing agent or as a daytime sedative is unsettled at the present time; however, available clinical evidence indicates that it is promising in this respect since it is the impression of both physicians and patients that the drug does exert a sedative action, especially in cases of anxiety and tension. Its action in patients with cardiac neuroses, nervous manifestations of the menopause, or hypertension is not established, and no information is available concerning its use as a preoperative sedative.

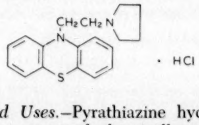
Side-effects so far reported from therapeutic doses of methyprylon have been infrequent and mild. These include occasional instances of vertigo and nausea and vomiting, none of which appears to be of great significance. In addition, hangover is less prominent than after the barbiturates. In the body, methyprylon is dehydrogenated to a tetrahydropyridine compound that appears in the urine in greater concentration than the parent drug. This analogue also appears in the bile. Since an analogous tetrahydropyridine has been implicated as a causative agent in agranulocytosis, caution should be exercised in administering methyprylon. To date, however, the drug has been administered to a large number of patients for prolonged periods without evidence of toxic effect on the kidney, liver, bone marrow, or the hematopoietic system.

Dosage.—Methyprylon is administered orally. The usual hypnotic dose for adults is 0.2 to 0.4 gm. at bedtime. Doses of 50 to 100 mg. three or four times daily have been employed for daytime sedation. Dosage for children is reduced proportionally.

Preparations for use as stated for the foregoing drug are marketed under the following name: Noludar.

Hoffmann-LaRoche, Inc., cooperated by furnishing scientific data to aid in the evaluation of methyprylon.

Pyrathiazine Hydrochloride.—10-[2-(1-Pyrrolidyl)-ethyl]phenothiazine hydrochloride.—The structural formula of pyrathiazine hydrochloride may be represented as follows:



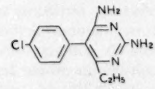
Actions and Uses.—Pyrathiazine hydrochloride, a phenothiazine compound chemically related to promethazine hydrochloride, is an effective antihistaminic agent with actions, uses, and side-effects similar to those of other drugs of this pharmacological class. A slight degree of nausea also may follow its administration. The development of agranulocytosis has been reported after administration of doses greatly in excess of therapeutic levels for periods of longer than a month. Blood cell counts should therefore be made at intervals in patients receiving this drug for long periods. (See the general statement on histamine-antagonizing agents in New and Nonofficial Remedies.)

Dosage.—Pyrathiazine hydrochloride is administered orally. The usual dose for adults is 25 to 50 mg. three or four times daily, preferably after meals and at bedtime. For children over 4 years of age, a dose of 12.5 to 25 mg. three or four times daily as required may be employed.

Preparations for use as stated for the foregoing drug are marketed under the following name: Pyrrolazote.

The Upjohn Company cooperated by furnishing scientific data to aid in the evaluation of pyrathiazine hydrochloride.

Pyrimethamine.—2,4-Diamino-5-*p*-chlorophenyl-6-ethylpyrimidine.—The structural formula of pyrimethamine may be represented as follows:



Actions and Uses.—Pyrimethamine, a diaminopyrimidine chemically related to chloroguanide hydrochloride, is a potent folic acid antagonist used as an antimalarial agent. Its antimalarial action is believed to be due to a differential requirement between host and parasite for the nucleic acid precursors involved

in growth. The drug is effective as a suppressive agent in malignant tertian (Plasmodium falciparum) malaria and benign tertian (P. vivax) malaria. Against overt infections, it is a slowly acting schizonticide. It interrupts transmission of the disease by arresting sporogony in the mosquito. Pyrimethamine is primarily useful, therefore, for the prevention of clinical attacks of both vivax and falciparum malaria and in preventing transmission by arresting sporogony. There also is evidence to indicate that, when a suppressive regimen is continued for a sufficient number of weeks to extend through the time when relapses would be expected, eradication ("suppressive cure") of vivax infections may result. The use of pyrimethamine as a suppressive agent in falciparum infections results in radical cure in most cases. Because of its slow onset of action, pyrimethamine should not be used for the treatment of acute primary attacks. For such attacks, a fast-acting schizonticide is indicated.

Primary resistance to the drug does not develop during its clinical use as a suppressant in the recommended dosage; however, cross resistance to pyrimethamine may develop in plasmodial strains that are already resistant to chloroguanide. The latter condition is usually the result of improper usage. Plasmodial strains that are resistant to chloroguanide and cross resistant to pyrimethamine have appeared in Malaya and certain other areas of the world where malaria is endemic. For this reason, the drug should be used with caution in areas where chloroguanide has been extensively or improperly used, and it should not be employed at all if the infection is known to be due to strains resistant to chloroguanide.

Pyrimethamine has a wide margin of safety, and, in therapeutic doses, its toxicity is very low; however, since the drug is a folic acid antagonist, gross and prolonged overdosage may produce toxic effects associated with folic acid deficiency. These include a megaloblastic anemia and, less commonly, leukopenia, both of which disappear rapidly when administration of the drug is discontinued.

Dosage.—Pyrimethamine is administered orally. In contrast to quinine or other antimalarials, it is tasteless. The usual dose for adults for suppressive prophylaxis is 25 mg. each week. This dosage should be continued indefinitely in areas where malaria is prevalent. The dosage for children under 15 years of age is 12.5 mg. weekly. If the regimen for suppressive prophylaxis is extended throughout all periods of exposure to malaria and through the expected periods of early recrudescence, suppressive cure of vivax infections may be obtained. The minimum time to achieve this result is usually 10 weeks. If late-relapsing strains are involved, a much longer period may be required for suppressive cure. If the characteristic time of relapse is known for a late-relapsing strain, the initial course of suppressive prophylaxis may be followed by another course of pyrimethamine during the period in which relapse is characteristically expected. Although pyrimethamine is not intended for therapy of acute attacks, it may be administered concomitantly with a fast-acting schizonticide to initiate transmission control by arresting sporogony in the mosquito. The dosage for this purpose is 25 mg. daily for the first two days. After remission of the acute attack, the usual suppressive prophylactic dose of 25 mg. (12.5 mg. for children) each week should be resumed.

Preparations for use as stated for the foregoing drug are marketed under the following name: Daraprim.

Burroughs Wellcome & Company, Inc. cooperated by furnishing scientific data to aid in the evaluation of pyrimethamine.

Intramuscular Use of Dimenhydrinate for Postoperative Nausea and Vomiting

The Council has evaluated the use of dimenhydrinate administered intramuscularly for the prevention and control of postoperative and postanesthetic nausea and vomiting. Because episodes of nausea or emesis after surgery are related to a great many causative and conditioning factors and represent wide ranges in type and severity, the Council found it difficult to arrive at a definite conclusion that would apply to all cases. In a series of over 9,000 unselected cases under partially controlled conditions of routine hospital practice and with all types of anesthetic agents and a variety of operative procedures, dimenhydrinate reduced the incidence of postoperative nausea and vomiting by approximately 50%. Conversely, a negative conclusion regarding its value has been reached in a smaller (85-patient), more accurately controlled series in which nitrous oxide and ether anesthesia were used. It is therefore apparent that the usefulness of dimenhydrinate for this purpose is unsettled. The majority of experts in this field seem to agree, however, that even if a slight reduction in postoperative nausea and vomiting can be proved statistically, the disadvantages of hypotension and longer postoperative sleeping time caused by administration of dimenhydrinate may conceivably outweigh its usefulness for this purpose.

Only the intramuscular route has been employed for the prevention and control of postoperative nausea and vomiting. The usual doses for adults vary. Some clinicians inject 50 mg. before surgery, 50 mg. after surgery, and then 50 mg. every 4 hours for four doses. For children under 5 years of age, all dosages are reduced to 25 mg. Other clinicians have employed a standard dose of 100 mg. for adults, injected shortly before completion of surgery.

The Council voted to amend the monograph on dimenhydrinate in New and Nonofficial Remedies accordingly to describe the intramuscular use of the drug for postoperative nausea and vomiting.

G. D. Searle & Company cooperated by furnishing scientific data to aid in the evaluation of the intramuscular use of dimenhydrinate for postoperative nausea and vomiting.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees
Editor and Managing Publisher . . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
Assistant Editor . . . . . WAYNE G. BRANDSTADT, M.D.

Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

PATHOGENESIS OF TUBERCULOSIS

GUEST EDITORIAL

J. A. Myers, M.D.

Nothing has deceived those seeking to treat and prevent tuberculosis more than its pathogenesis. Early pathological observations established the prevalence of primary tuberculous complexes with pulmonary and regional lymph node components. These were frequently seen in the bodies of persons who had no evidence of clinical tuberculosis in life and in whom none was found at autopsy. Such apparently well controlled primary complexes were also seen in bodies with coexisting destructive and progressive tuberculous lesions. Ghon[1] dissected 184 bodies of children who had reacted to tuberculin and in all but seven found the pulmonary and/or regional lymph node components of primary tuberculous complexes (five located extrathoracically). Since then the pulmonary component has been known as the Ghon tubercle.

When periodic tuberculin testing of children was introduced, it was observed that, in most of those whose skin reaction had recently become positive, roentgenograms of the chests were clear, but in a few (rarely more than 8%), at about the time allergy was first detectable by the tuberculin reaction, shadows interpreted as representing pulmonary infiltrations were seen. They varied in size from those scarcely visible to those that involved large areas. Prolonged observation showed that most of these lesions represented only the inflammatory stage of Ghon tubercles.[2] After becoming well established, they were rarely seen to increase in size, but occasionally one would reveal evidence of a minute central excavated area, cause a small amount of hemoptysis, and for a brief time present tubercle bacilli in washings from the stomach. The primary infiltrates were usually in evidence without much change in their shadows for a year or longer, after which they slowly resolved and the shadows completely disappeared or, at most, left small densities thought to represent deposits of calcium.

The regional lymph node component sometimes resulted in enlarged hilar shadows, but more often these areas appeared normal. This was difficult to understand, since pathologists had observed that the parenchymal primary focus is accompanied by involvement of regional lymph nodes. This apparent discrepancy was clarified by McPhedran,[3] who was unable to detect lymph node enlargements on x-ray films unless they extended outward and encroached on the lung parenchyma. This was also observed even after he had removed the lungs from the thorax before making x-ray film inspections. Although the lymph node component of most primary complexes did not cast visible x-ray shadows early in the course of the disease, in some (rarely more than 25%) x-ray evidence of calcific deposits was seen in the hilar region a few years later.

In the early years of these observations, the fresh shadow-casting lesions seen in the chests of children who had recently become tuberculin reactors were thought to be serious and treatment was recommended although the children were asymptomatic. Treatment was not always accepted, and continued observation showed that, regardless of how much or how little treatment was administered, these lesions with almost uncanny uniformity ultimately resolved without their hosts having suffered significant illness.[2b] The deceiving aspect of these observations was that 92 to 95% of those who had recently become positive reactors did not show shadow-casting lesions on x-ray. Ghon[1] had demonstrated that lesions are nearly always to be found in tuberculin reactors, but the minuteness of the lesions often made it difficult to locate them at autopsy and impossible to locate them in most cases on x-ray film. It is now known that tuberculin reactors possess tuberculous lesions and that our crude methods of examining the living body enable us to locate only those lesions that are gross and dense and are so placed as to cast visible shadows on x-ray film, but the demonstrable primary lesions are of no greater significance than the smaller ones. Thus, we need no longer be deceived by the absence of shadow-casting lesions on roentgenograms of chests of tuberculin reactors.

Nearly three decades ago, when it was assumed that practically all adolescents and young adults were infected with tubercle bacilli, testing showed most of them were uninfected.[4] Periodic testing of these uninfected young adults revealed that among those who became infected, as manifested by conversion of the tuberculin reaction, about the same percentage had primary infiltrates of such size, consistency, and location as to cast visible x-ray shadows; these infiltrates also behaved exactly like those occurring in children.[5] Continuous observation has confirmed these findings.[6]

In all of their stages, lesions of primary tuberculous complexes are usually so benign that their hosts do not suspect their existence unless examinations are made, and then the vast majority are detected only by the tuberculin reaction. Apparently, this almost uniform benignity of lesions of primary complexes is due to their beginnings in normal tissues, where the response is nonspecific and the defense mechanism is permitted to operate without interruption. By the time the defense mechanism becomes handicapped by allergy to tuberculoprotein, foci of tubercle bacilli are usually reasonably well encased, and thus in most instances they result in practically no destruction.

From the Department of Internal Medicine and the School of Public Health, University of Minnesota, Minneapolis.

The reinfection type of tuberculosis is about as different in its behavior from the primary type as though two distinct disease entities were involved. This is due to the introduction of allergy or sensitivity, which seriously handicaps the natural defense mechanism. It is this sensitivity that encumbers the body's defense against tubercle bacilli to such a degree that it can no longer be depended on with certainty to protect against future invasions of tubercle bacilli. Because of sensitivity, tuberculoprotein becomes so poisonous to cells and tissues that new implantations of bacilli are met with a much more intense response of the defense elements than that to the initial invasion. Thus, in the vicinity of new implantations, liberation of tuberculoprotein results in death of cells with which it comes in contact. Therefore, many of the defending white blood cells are lost, and the others are not able to destroy all tubercle bacilli; but, even with this severe handicap, the defense mechanism often partially wins in surrounding the new invaders with fibrous tissue so they are held in check at least temporarily. On the other hand, the defense mechanism fails often enough to account for all the illness and death caused by tuberculosis.

In any tuberculosis control program, it is important to differentiate between the primary and the reinfection types of disease. If this is not done, undeserved credit is awarded certain preventive and therapeutic efforts. Moreover, a state of confusion is created. The only certain way to determine whether a given lesion is of the primary or the reinfection type is to have had periodic tuberculin testing and to know when conversion of the tuberculin reaction occurred. Tuberculous infiltrates in evidence by the shadows they cast about the time allergy can first be elicited by the tuberculin reaction are almost always parts of primary tuberculous complexes—Ghon tubercles. Lesions that first appear in persons whose sensitivity has existed longer than three months are more likely to be due to reinfection, but some primary infiltrates do not acquire adequate consistency to cast x-ray shadows until after they are three months old. Therefore, if one desires to truly differentiate between primary and reinfection types of pulmonary lesions, one must periodically test nonreactors to tuberculin every two or three months. Rarely is it possible to differentiate between primary and reinfection types of infiltrates by x-ray films early in the course of their development, since they cast identical shadows. The belief that with primary infiltrates there is always evidence of hilar lymph node enlargement detectable by x-ray film must be abandoned.

Erroneous deductions have been drawn from efforts to prevent tuberculosis by giving various agents because primary infiltrates were not identified and properly classified. Experiments, consisting of artificially producing primary tuberculous complexes in the skin and regional lymph nodes by a variety of acid-fast organisms and comparing the immediately subsequent roentgenographic changes in the lungs of these subjects with those of persons allowed to become infected from current patients, have only led to confusion and deception. A number of reports have appeared in the literature stating that clinical tuberculosis is developed four or five times more often among those who become infected from current patients than among those in whom primary complexes have been artificially established in the skin and regional lymph nodes. In no such report yet analyzed has an attempt been made to differentiate between primary and reinfection clinical disease. Practically all shadow-casting lesions that have appeared in those who became naturally infected have been regarded as clinically significant.

Inasmuch as 5 to 8% of persons who become infected naturally may present shadow-casting primary infiltrates (Ghon tubercles), which may be in evidence for one or more years, such tubercles, together with the nonvisible primary complexes present in all tuberculin reactors, should be classified with the primary lesions, large and small, artificially produced in the skin and regional lymph nodes. Those who have had lesions of primary complexes established artificially in the skin and regional lymph nodes could not be expected to have such complexes appear in the lungs in any appreciable number. Therefore, the location of primary lesions and the classification of those appearing in the lungs as clinical lesions have apparently been largely responsible for the deduction that four or five times more naturally infected persons develop clinical lesions than those artificially infected. The number of primary infiltrates (Ghon tubercles) that cast x-ray shadows in the lungs of those naturally infected is adequate to account for most of the difference.

One group is in as good health as the other as far as primary tuberculosis is concerned, whether the bacilli were administered artificially or were acquired naturally. Indeed, all tuberculin reactors in each group have tuberculous lesions. Therefore, the often reported four or five times as much tuberculosis seen in those naturally infected becomes insignificant. It is only the reinfection clinical type of tuberculosis that appears in one group that is comparable to that which evolves in the other that determines the value of the method intended to prevent tuberculosis. Chronic pulmonary tuberculosis is usually the result of a slow, evolutionary process. It may start to evolve within a few months after the initial invasion with tubercle bacilli or at any subsequent time during the remainder of the patient's life, including old age. Tuberculosis is a lifetime disease. Therefore, in observing persons who have recently been naturally or artificially infected, a period of 5 years is almost nothing, and 10 years is very little, if one desires to avoid erroneous deductions.

---

1. Ghon, A.: Primary Lung Focus of Tuberculosis in Children, London, England, J. & A. Churchill, Ltd., 1916.
2. (*a*) Myers, J. A.; Harrington, F. E.; Stewart, C. A., and Wulff, M.: First-Infection-Type Tuberculosis: Its Treatment and Prognosis, Am. Rev. Tuberc. **32**: 63-643 (Dec.) 1935. (*b*) Myers, J. A.: First Infection Type of Tuberculosis: Its Preallergic and Postallergic Stages of Development, ibid. **34**: 317-339 (Sept.) 1936.
3. McPhedran, F. M.: Diagnosis of Tracheobronchial Tuberculosis, Am. J. M. Sc. **173**: 245-258 (Feb.) 1927.
4. Lees, H. D., and Myers, J. A.: Tuberculosis Infection Among Adults, Am. Rev. Tuberc. **21**: 532-540 (April) 1930.
5. Myers, J. A.; Diehl, H. S.; Boynton, R. E., and Trach, B.: Development of Tuberculosis in Adult Life, Arch. Int. Med. **59**: 1-30 (Jan.) 1937.
6. Myers, J. A.: Primary Tuberculosis Acquired in Adulthood, Dis. Chest **22**: 293-312 (Sept.) 1952.

There is good reason to believe that failure to differentiate between the primary and reinfection phases of the disease is responsible for the concept that most clinical tuberculosis develops in people within two years after the initial invasion of tubercle bacilli. In persons in whom primary infiltrates have been identified, classified, and kept under observation, this concept has not been substantiated. Chronic reinfection types of lesions appear from year to year, and those that become demonstrable more than two years after the invasion greatly outnumber those that evolve earlier. Inasmuch as demonstrable primary tuberculous infiltrates nearly always resolve, regardless of how much or how little treatment is administered, no claim can be made for the efficacy of a therapeutic agent in any group of treated patients that includes a large number with only primary infiltrates. There is no doubt that the enthusiasm would have vanished from reported results of several forms of treatment of pulmonary tuberculosis as well as preventive efforts in the past had those persons with benign nonclinical primary infiltrates (Ghon tubercles) been removed from the series. This will be true of present and future reports except when heed is taken and patients with primary lesions are eliminated or are compared with or included with those having other primary lesions rather than with those having the clinical reinfection type.

CYSTIC FIBROSIS

Cystic fibrosis is a hereditary disease seen in children in which many or all of the exocrine glands are affected.[1] It is rare in Negroes and never seen in Mongolians but occurs in about one in 600 live births in the white population. In most but not all infants with this disease, pancreatic deficiency is present from birth, as shown by a marked decrease or absence of amylase, lipase, and protease in the duodenal fluid. This is due to a plugging of the pancreatic ducts by amorphous eosinophilic concretions assumed to be highly concentrated normal secretions. As a result ingested food passes through the digestive tract largely undigested. The patient is usually hungry but, despite an adequate food intake, is undernourished. The stools are copious, greasy, and foul-smelling but not watery. Dammed-back secretions appear as cystic distentions in the pancreatic ducts, and the parenchyma becomes atrophic and fibrotic.

Scanty but excessively viscid mucus, such as that found in the pancreatic ducts, may also obstruct the bronchioles. Pulmonary involvement usually becomes manifest between the ages of 6 months and 2 years but may be evident a few days after birth and occurs sooner or later in all patients with this disease, more often than not after an acute upper respiratory infection. After the fever has subsided, an unproductive cough persists. This is the most serious aspect of the disease and the one that accounts for most of the deaths. An obstructive emphysema usually occurs and later a chronic bronchopneumonia, with clubbing of the fingers, cyanosis, respiratory acidosis, and cor pulmonale. Many patients with this condition are given diagnoses of chronic intractable asthmatic bronchitis. Di Sant' Agnese [2] says that the sweat glands of patients with cystic fibrosis are always affected in such a way that the patients lose an excessive amount of sodium and potassium chloride in their perspiration. This renders them unduly susceptible to heat exhaustion in the warm weather. In some patients the liver is affected and hepatic cirrhosis develops, in some the secretory rate of the parotid glands is increased with a further loss of electrolytes, and in some meconium ileus occurs. This type of ileus may be the first manifestation of the disease and may require surgical intervention.

The diagnosis is based on finding evidence of pancreatic insufficiency, obstructive emphysema, an increased concentration of electrolytes in the sweat, and the same disease in one or more of the patient's siblings. The sweat test is the most reliable single test because it is often positive in the absence of signs of pancreatic or respiratory disorders or of other cases in the same family. Richmond [3] calls attention to the value of a chymotrypsin assay in patients with partial pancreatic insufficiency. With better understanding of this disease, the prognosis, once very poor, has been improving. About 10% of these patients have intestinal obstruction at birth. About half of these patients die and in the rest the obstruction is relieved by operation. The pancreatic insufficiency can be controlled by giving a low-fat, high-protein diet, with simple sugars rather than starch supplying about half the calories. At least 20% more calories than the calculated requirement should be given daily. Large doses of vitamins A and D should also be supplied and pancreatin should be given with every meal.[4] These measures prevent deaths due to malnutrition. Deaths due to heat exhaustion can be prevented by increasing the intake of salt, especially in hot weather. It is essential to replace the potassium as well as the sodium loss.[5] Patients with liver involvement will also require vitamin B and liver extract. This leaves one important hurdle in the form of the respiratory complications, and it is on these complications that the prognosis in any given patient ultimately rests. If these are not treated most patients will die. Broad-spectrum antibiotics, penicillin, and streptomycin given intramuscularly and by aerosol as long as there is roentgenographic evidence of pulmonary involvement will tide many of these children over into their teens, when the disease becomes less threatening. Although the term cystic fibrosis is a misnomer, it should be retained until the pathogenesis of the disease as a whole is better understood.

1. di Sant'Agnese, P. A.: Fibrocystic Disease of Pancreas, a Generalized Disease of Exocrine Glands, J. A. M. A. **160**: 846-853 (March 10) 1956.
2. di Sant'Agnese, P. A.: Pulmonary Manifestations of Fibrocystic Disease of Pancreas, Dis. Chest **27**: 654-667 (June) 1955.
3. Richmond, R. C., and Schwachman, H.: Studies of Fibrocystic Disease of Pancreas (Mucoviscidosis): Chymotrypsin Activity of Duodenal Fluid, Pediatrics **16**: 207-212 (Aug.) 1955.
4. Andersen, D. H., and Mike, E. M.: Diet Therapy in Celiac Syndrome, J. Am. Dietet. A. **31**: 340-346 (April) 1955.
5. Harris, S. J., and Lester, R. L.: Importance of Potassium in Heat Exhaustion in Fibrocystic Disease of Pancreas, New England J. Med. **253**: 223-226 (Aug. 11) 1955.

ORGANIZATION SECTION

CONFERENCE ON MEDICAL CARE IN BITUMINOUS COAL MINE AREA

Methods of developing better liaison between the medical profession and the United Mine Workers Welfare and Retirement Fund, in order to continue the gains made in improving the quality of medical care for coal miners, was the major theme of the Fourth Conference on Medical Care in the Bituminous Coal Mine Area, held May 6 in Charleston, W. Va. The conference, sponsored by the Committee on Medical Care for Industrial Workers of the Council on Medical Service and the Council on Industrial Health of the American Medical Association, was attended by 90 representatives of state medical societies, the A. M. A., and the UMWA Welfare and Retirement Fund.

Prior to the conference, there was a two-day field trip, which covered more than 400 miles in the Bluefield and Beckley coal mining areas of West Virginia and Virginia. Traveling in police-escorted motor caravans, about 30 conference participants visited a dozen hospitals, clinics, medical group buildings, and coal camp physician's offices. They drove through an exhibition mine, and they also toured part of an operating shaft mine 441 ft. below the ground surface. The field trip offered a firsthand, on-the-spot view of how coal miners live, work, and receive medical care.

Pennsylvania Agreement

One of the conference highlights was a report on the so-called Pennsylvania agreement between the Medical Society of the State of Pennsylvania and the Medical Service of the UMWA Welfare and Retirement Fund, which was outlined by Dr. Edgar W. Meiser of Lancaster, chairman of the state society's committee on medical economics. A full text of the agreement, offered as a guide to other state medical societies, was published in the May 12 issue of THE JOURNAL, page 164.

Touching on the same subject, Dr. Warren F. Draper of Washington, D. C., executive medical officer of the UMWA Welfare and Retirement Fund, told the conference:

> Much interest in the Pennsylvania agreement has been evinced by the medical societies of other states which are eager to reach a similar understanding on matters which are a source of irritation and discord at various points within their states. They likewise are desirous of working out an agreement that is in the interest of the patient and fair and just to all concerned. While there are certain basic principles that apply to similar situations everywhere, there are wide variations in conditions of medical practice in the different states and communities. I believe that these must be considered, and that each state within the framework of generally accepted principles must work out the details of an agreement to coincide with the particular conditions it has to face.

In addition to Dr. Meiser, physicians who presented reports from their state society liaison committees were Carl H. Fortune, Lexington, Ky.; R. B. Wood, Knoxville, Tenn.; James P. Williams, Richlands, Va.; and J. C. Huffman, Buckhannon, W. Va.

Basic points of the Pennsylvania agreement, as outlined by Dr. Meiser, are as follows: 1. All contemplated changes in operating policy of the fund shall be presented on a state level, with the reasons for the proposed changes. If no agreement is reached on a state level, the problem will be referred to the A. M. A. Committee on Medical Care for Industrial Workers. 2. All participating hospitals shall establish full medical audit committees, to assure a high quality of medical care and to insure that physicians are judged by the medical profession and not by any third party in the field of medical care. 3. The agreement recognizes not only the specialty groups but also the county medical society as a qualifying agency in determining the competency of a participating physician. 4. All who apply as participating physicians shall be listed in a designated category with the mutual approval of the fund and the county medical society. 5. Causes for removal of physicians from the participating list are defined. 6. The agreement establishes a definite system of liaison, including the local, county, district, state, and national levels of organized medicine.

Dr. Fortune, who presented six specific questions regarding general policy, declared that "the physicians of Kentucky are anxious to know whether the UMWA Welfare and Retirement Fund contemplates changes in fundamental policy in the Virginia, West Virginia and Kentucky coal fields as a result of the opening of the Memorial Hospitals." Dr. Wood, pointing out that people today want truly comprehensive medical care, urged the medical profession to give close attention to the difficult problems that exist with respect to quality, distribution, and cost.

Dr. Williams reported that "consultation service provided by the UMWA Welfare Fund has been a great benefit and an invigorating help to the hospitals in the Virginia area," and he recommended that the consultation service be extended to general practitioners in the area. Dr. Huffman told the conference that most of the component medical societies in West Virginia have established UMW advisory committees and are resolving their problems with the area medical administrators at the local level, and the administrators are using the local committees to help solve their problems with the profession.

Delivering reports as area medical administrators for the UMWA Welfare and Retirement Fund were Drs. F. H. Arestad, Johnstown, Pa.; Asa Barnes, Louisville, Ky.; Leslie A. Falk, Pittsburgh; Hubert T. Marshall, Morgantown, W. Va.; and John D. Winebrenner, Knoxville, Tenn.

Speaking of the Pennsylvania agreement, Dr. Arestad urged that "we all give full support to the new agreement, accept it in good faith, apply it fully in the interest of good patient care, and help to make it a symbol of the highest type of cooperative relationship in the medical field." Dr. Barnes reported improved medical facilities and better professional relations in the Kentucky coal mine area, adding that "we have all accepted the joint responsibility and are working

together on the same team to maintain and improve standards of medical care." Dr. Falk said there is still a severe need for additional physicians in some mining communities, and he urged an acceleration of efforts to locate good quality physicians and make practice attractive enough in these communities.

Dr. Marshall declared that "the solution of the problem of unnecessary hospitalization and unnecessary procedures, surgical or otherwise, is dependent on organized medicine accepting its responsibility for providing a more favorable professional environment so that the individual physician will have unified support for honest decisions." Reporting that "more genuine progress has been made during the last two years than in all previous years of our experience," Dr. Winebrenner said the progress has been paced by the internal organization of hospital staffs to conduct medical audit effectively and to institute self-criticism in lieu of rationalization.

Summarizing his remarks to the conference, Dr. Draper emphasized that "all the Fund has ever asked or continues to ask is that a good quality of medical care be provided for its beneficiaries at a cost that is fair and just as determined by the medical profession itself. We are profoundly grateful to organized medicine for providing the means whereby all the factors giving rise to controversies, with complete supporting data on both sides, may be presented to fair, unbiased, judicial bodies at county, regional, state and national levels, for examination, investigation and recommendation based on full knowledge and understanding of the background and all the elements involved. I believe that through our joint efforts this is by far our greatest accomplishment to date."

Three members of the Committee on Medical Care for Industrial Workers took part in a panel discussion based on reports presented to the conference. They were Drs. Frederick W. Slobe, Chicago; Edwin P. Jordan, Charlottesville, Va.; and M. N. Newquist, New York City. Urging recognition of the fact that change is inevitable, Dr. Slobe said plans like the UMWA program are "the antithesis of socialized medicine" and will help prevent government control over medicine. Dr. Jordan, who pointed out that there are nonmedical as well as medical reasons for the problems of overhospitalization, suggested a study of the experience in the new UMWA Memorial Hospitals. The new service provided by those hospitals should supplement rather than replace existing facilities, Dr. Newquist declared, adding that, when there is a lack of adequate facilities, community action is better than that by any one group.

Two-Day Field Trip

Dr. Leo Price of New York City, a member of the A. M. A. Commission on Medical Care Plans, reported at the conference luncheon on the two-day field trip to the Bluefield and Beckley coal mine areas. The following excerpts from his report reflect the general impression gained by those on the tour:

> The medical installations visited make me feel that within the limited observations possible, good hospital service is being provided both by the numerous hospitals visited in this area and the new mineworkers' hospital (Beckley Memorial). We saw primarily proprietary hospitals which were attractive and whose facilities were good, except in one or two instances. Even when the facilities did not reach the high standards of the others, the good quality of service did not seem to be affected by these remediable physical imperfections.
>
> From what we were able to gather concerning the qualifications of the individual physicians and other personnel in the hospitals, it was apparent that the institutions are manned by well-trained, competent staffs. The personal integrity and the zeal and interest of many of the physicians and nurses was pleasantly evident.
>
> The rates charged must be regarded as fair, and in some instances low, for the good facilities offered patients. The basic charges include many services which I have found charged for as "extras" in other areas. The services given for these low rates may be compared with those of many large centers in metropolitan areas and perhaps are far more personalized.
>
> In these hospitals when special qualifications are needed to solve a medical problem, such services are sought elsewhere for the good of the patient.
>
> To me, coming from a metropolitan area, the different connotation of the word 'proprietary' is interesting. To me this has meant an institution operating primarily for profit. I have been happy to learn that this motive wasn't the primary interest in most of the hospitals visited. It was conveyed to me that patients without sufficient financial resources for the care were admitted and that no barrier was raised to their readmission. The physicians in these communities seem to have filled the gap in providing care to medically indigent patients who normally receive such care through community resources. Because there are no community resources in the area we visited, the proprietary hospitals provide this care.
>
> It would seem that one of the problems the physician should consider is how to arouse the community to the responsibility for providing service to the medically indigent class. The physicians' traditional acceptance of responsibility for the treatment of all ill is more than evident in this area.

Places visited on the field trip were Memorial Hospital in Princeton, W. Va.; St. Luke's Hospital, Bluefield Sanitarium Hospital, and Bluefield Sanitarium Clinic, all in Bluefield, W. Va.; the Pocahontas exhibition mine near Bluefield; a company doctor's office in Bishop, Va.; Mattie Williams Hospital and Clinch Valley Clinic Hospital in Richlands, Va.; Wyoming General Hospital in Mullens, W. Va.; the Cranberry Mine at Beckley; and the Beckley Medical Arts Building, Beckley General Hospital, Raleigh General Hospital, and UMWA Memorial Hospital, all in Beckley.

The first day of the field trip included luncheon at the Bluefield Sanitarium Hospital and a dinner meeting with the Mercer, McDowell, Tazewell, and Giles County Medical Societies at the Bluefield Country Club. Luncheon the second day was at the Black Knight Country Club in Beckley, and dinner with the Raleigh, Wyoming, and Fayette County Medical Societies was at the Beckley Elks Club. Arrangements for the field trip and local meetings were made by Drs. Frank J. Holroyd of Princeton; W. Fred Richmond, Charles W. Merritt, and Deane F. Brooke of Beckley; and William H. Riheldaffer of Charleston. Mr. Charles Lively, executive secretary of the West Virginia State Medical Association, handled local arrangements for the Sunday conference.

Dr. William A. Sawyer of Rochester, N. Y., Chairman of the Committee on Medical Care for Industrial Workers, presided over the conference, and Dr. A. R. Lutz of Parkersburg, president of the West Virginia State Medical Association, gave the address of welcome. Also participating in the conference were representatives from the state medical societies of Alabama, Arkansas, Colorado, Illinois, Ohio, and Oklahoma.

COUNCIL ON MEDICAL SERVICE

SURVEY OF GROUP PRACTICE

PRELIMINARY REPORT

In 1954 the Council on Medical Service of the American Medical Association and the American Association of Medical Clinics embarked on a joint survey of group practice. The purpose of this survey was to collect information that would be of value to physicians who desire to practice together in groups. The questions asked in the survey, therefore, were designed to provide answers that would shed light on what problems are faced by physicians in forming groups, how these problems are being met, and what constitutes a successful group.

Because most groups, regardless of the ultimate size that they attain, start with a small number of physicians, most of the groups included in the survey were fairly small, though some had been in existence for many years. This preliminary report is based on personal visits to 48 groups. The information obtained has been abstracted, and wherever possible the replies to questions have been arranged in order of frequency. The first section of each discussion deals with the answers given to the questions. This is followed by a brief critical comment on those answers.

This is not intended in any sense as a guide or manual for group practice. Rather it is a factual study of how a sample of group practice clinics operate and their past and present experience. The survey will be completed this summer, with visits to some 50 additional groups, and may provide for the preparation of more specific comments or recommendations on organization and procedure.

Reasons for Starting Group Practice

The first question of the survey asked why the particular group was started. To this question 40 of the 48 groups gave replies that could be analyzed.

The largest number, 16 in all, stated that the reason behind the organization of their group was that better medicine and service could be practiced by a group than by an individual. This was expressed in almost identical language in each of the replies, e. g., "It was felt that a group could provide better medicine for the patient and for the doctor. The physicians could devote more time to their specialty." "The doctors thought they could practice better medicine in a group than separately."

The second largest group of replies were from those who stated that the practice of one or more men grew too large and that more assistance was needed; hence the group started. Nine indicated that this was the primary reason for the formation of the group. Here too the replies were strikingly similar: "One doctor's practice had become too large for him to handle by himself." "The practice of the individual doctors had outgrown them and they thought that by combining and hiring additional doctors they could better take care of the patients. They combined strictly as a matter of economy and a reduction of individual responsibility."

It was interesting to note that in the third largest group, totaling seven, a family of physicians working together had decided to engage in group practice. "Two brothers, both surgeons, were born and raised in a town." "Three brothers decided to practice together. They were all general practitioners." "A father, in a period of many years, had built an exceptionally large practice and wanted his sons to come in with him."

Next on the list of reasons for starting a group were replies from six groups who indicated that the primary factor was the belief that the group method of practice was more convenient or more secure for the doctors involved. "A group was a more convenient method of operation between the doctors of a small town. They would buy a building and work together." "The town needed a small hospital, therefore, these doctors designed, financed, and are now operating a hospital. It connects with their clinic." "Six doctors were practicing in the same town and decided to join their efforts in group practice." "Doctors believed they would have better security in a group."

Two of the surveyed groups listed other reasons. One said: "The idea originated when the doctors were in the army." The other stated: "Due to circumstances, a beautiful mansion was left vacant, which could be purchased at a reasonable price. Because of this two doctors bought the building and remodeled it for their office. Thus, they started a group."

Comment.—From the standpoint of the quality of the practice of medicine, the reason given by the 16 in the largest group, namely, that better medicine could be practiced by a group than by an individual, seems to be the most praiseworthy. One would expect that those groups organized for this reason would be likely to plan their futures more carefully than some of the others, though this conclusion is not subject to confirmation from the facts available. It is a more idealistic approach than some of the other reasons given for starting a group, but the fact that so many reasons were supplied suggests that motivation is frequently multiple and that, perhaps, the original motivation may be modified in time so that the ultimate structure attained is less due to the original reasons for starting than to other factors.

Mechanics of Starting Group Practice

The second question in the survey was aimed at elucidating the mechanics of starting a group: "How are groups started?" Unfortunately, the replies are rather vague in most instances; perhaps this illustrates the rather haphazard way in which many physicians seem to enter into group practice. The only way of handling the answers to this question is to quote some of the replies: "As practice increased doctors were hired to take care of it. The founder decided that he would retain doctors with the group if they were permitted to buy into it and become partners. A group

was thus organized." "A physician brought in another doctor with him, then his two sons started practicing with him and the clinic was born." "A building was purchased and remodeled and after adding an additional doctor they began practicing as a group." "One of the surgeons got the doctors together at his house for dinner, and presented the possibility of a group practice." "Two friends were discharged from the army and they selected another man and the group was started." "A business man was hired to organize, build, and finance the building and get the group started properly."

Comment.—The replies to this inquiry are not particularly revealing. Perusal of all of the answers suggests that there were two principal methods of starting groups: (1) the formation of a partnership with pooling of income and expenses by physicians already practicing in the locality and (2) the addition of assistants to a physician whose own practice had become too heavy to carry alone. In both of these methods there is a hazard that the future growth and the development of the group are insufficiently studied at the onset. There is little in the replies to indicate a well thought-out plan of future growth and development, though this may have taken place more often than it was expressed. It is believed that, regardless of how a group is started, plans should be drawn at the outset for professional growth as well as for physical facilities that would be necessary in such growth.

Choice of Location

All 48 clinics surveyed replied to the question, "How was the location decided?" Forty-two mentioned simply that the doctors were already practicing in the community—either those who formed the partnership or the original founder. Four said that the location was determined because of the industry surrounding the area, because of the potential growth of the area, or because a relative owned a bank building or other suitable quarters. Two gave miscellaneous reasons. One said that there was an advertisement in the newspaper that stated that a group was wanted to practice in a certain city and that there was a large growth of population in the area. The second answered the question as follows: "The men were from the surrounding countryside. The location of the hospital in the town decided the location. Also the county was large and wealthy, only 200 miles from a large clinic and 60 miles from a large city."

Comment.—The replies to this question clearly indicate that groups are formed not so much in response to particular need or study of a community as to the fact that doctors are already in the area and wish to stay. In view of the fact that local acceptance of practicing physicians is based so largely on familiarity, it seems likely that this method of establishing groups will remain the predominant one. There seem to be no objections to any method of determining a location for a group, though most of the methods given in the answers might or might not fulfill the needs for supplying medical care to communities requiring such service.

Size of Groups When Formed

All but 2 of the 48 groups gave information on the question, "How many doctors started the group?" Twenty of them reported starting with 2 or 3 physicians, 16 with 4 or 5, 8 with 6 to 10, and 2 with over 10. Of the 20 groups that started with 2 or 3 physicians, 5 still consisted of 3 or 4 after from 1 to 28 years in existence; 10 reported from 5 to 8 physicians after being in existence from 3 to 30 years; and one stated it had a staff of 10 after 51 years. Four of these groups consisted of 12 physicians after from 15 to 40 years of existence. The largest of these consisted of 16 physicians.

Of the 16 groups that started with 4 or 5 physicians, 2 still reported 4 or 5 physicians after 6 to 8 years, respectively; the others ranged from 6 to 23 physicians after from 1 to 49 years in existence, and 10 of them had 10 or more physicians. Eight of the groups reported starting with 6 to 10 men; the smallest of these consisted of 7 after 38 years and the largest 28 after 36 years. With the exception of the one group of 7, all included over 10 physicians after 3 to 36 years. Finally, of the two groups starting with 10 or more, one had grown to 17 after 2 years and the other to 13 after 34 years.

Comment.—It is difficult to draw any general conclusions on the rate of growth from these data. The number of physicians in a group does not seem to be dependent on the size of the original starting organization, although none of the smallest exceeded 16 men, even the one that had been in existence for 51 years. Apparently, therefore, the rate of growth is dependent on factors other than starting size and proceeds, when it grows at all, at rates that are not necessarily dependent on the number of years in existence.

Early Problems

Forty of the groups replied to the question concerning their early problems and how they were met, and several listed more than one problem. For this reason, the answers total more than 40. The largest number, nine, stated that the principal problem with which they were faced was the professional composition of the group, including the difficulty in selecting physicians to round out the professional staff and too rapid turnover. Replies such as this were recorded: "The problem which arose initially was one of keeping doctors with the group. It was hard to find physicians who would stay on a salary." "The problem was to balance the group and of obtaining qualified internists to do so." "The problem has been to get men to stay with the group. The present average age is 30, which means that the doctors come for experience rather than permanency."

Fifteen groups reported that their principal early problem was in the financial field: How to handle accounts receivable acquired prior to forming the partnership, division of income, and establishment of a bookkeeping system. Typical quotes are as follows: "The most difficult problem was to decide how to dis-

tribute the profits. They finally decided to share and share alike." "Primary problem was lack of capital. Doctors borrowed, skipped their salaries, and practically starved. Also, they had no follow-up in their collection tactics. A good bookkeeping system and a bookkeeper are necessary. If a group can afford it, a good business manager should be obtained." "Greatest problem was that of distribution of net earnings, though one physician had the greatest practice, they all decided to share alike." "The problem of how to properly handle their capital account when taking on junior partners and how to credit each senior and junior partner with his share of the capital assets was, and still is, the major problem." "It is difficult to get the doctors to contribute enough from their personal incomes to pay for the clinic facilities reserve fund, etc."

Six groups stated that their principal early problem was the adjustment of personality differences. One stated that, even in a small group of six, personality differences can cause problems. Five stated that the major problem was deciding who was boss. This, in turn, is closely allied to personality difficulties as is well illustrated by one reply: "The major problem was to decide who was to be 'boss.' After this was determined one of the doctors left the group." No early difficulties at all were admitted by five of the groups, perhaps because there were none, or perhaps because the memory of those that had existed had faded. It might be added here that one of the men making the survey had this personal comment to offer, "It is my belief that 'Personal Differences' is a result rather than a cause. In almost every case where the group stated that they had, or were having, personality differences, I found sloppily written partnership agreements, no definite method of promoting a new man to partnership, unfair distribution of work or earnings, and little or no planning."

Two groups named as their major difficulty early antagonism from the local physicians or the county medical society. One stated that "two doctors moved into a town where the average age of the physicians was about 70; therefore, the other doctors looked down on the young squirts." The other mentioned specifically the antagonism of the county medical society and stated that the unfavorable feeling shown by individual practitioners toward the group has not diminished. Finally, one group mentioned a problem connected with the local hospital. The statement is not completely clear: "The group was originally located in a hospital. They found that they had to furnish and manage the hospital which presented problems."

Comment.—The answers to this question are illuminating. They indicate that physicians who are contemplating forming a group should (1) evaluate and plan a partnership agreement or other professional structure that will make it possible to add and keep the desired physicians; (2) obtain advice from someone with financial experience on the financial problems likely to be encountered, such as division of accounts built up prior to the partnership, bookkeeping system, and the source and repayment of capital (the problem of division of income among groups is partly professional and can be based, to some extent, on experience and will be discussed elsewhere); (3) recognize the importance of personality differences and attempt to select physicians who can work well together; (4) establish at the outset an administrative system that will place in the chief professional administrative post the physician best qualified for the job; (5) take whatever measures possible at the beginning to establish as good relations as possible with the local physicians and the county medical society; and (6) anticipate, so far as is possible, the relationship that should exist between the group and the local hospital. Most of the problems encountered can be avoided, or at least minimized, by recognizing them at the start and taking appropriate measures to solve them before they reach a serious stage.

Office Facilities

All 48 groups gave information in reply to the question, "What were the starting office facilities?" The largest number, 17, stated that they financed and built their own clinic building. Here are typical replies: "The original building was designed and built to house two doctors. However, before they moved in they formed a partnership of four, so immediately started expanding." "A beautiful new building was constructed; the building is held in an outside partnership in which each of the three partners are equal." "The founder of the group bought, and paid for, a new clinic; $90,000 was spent for the building and equipment. He now rents the building and equipment to the group." "The doctors built a beautiful clinic building. It is held by an outside corporation whose stockholders are the doctors in the group." "The men borrowed money and obtained a G. I. loan for the balance in order to build their building. They are still housed in it." "The new building was constructed, which was financed by the individual men plus a loan secured from the bank."

Fourteen of the groups reported that they purchased and remodeled a building that was already constructed. This was sometimes an apartment house, an office building, or an old home. Rented space in an office building or house was reported by 11 of the groups. Several stated that the space was inadequate, though some apparently had not found this to be the case. One group stated, "The cost of the building we planned was too high so we moved into an office building. The group still rents office space in a commercial building and we have regretted it ever since." Another answered, "The original building was a small office building, which was very inadequate."

In five instances the group reported that it started in, or in close association with, the physical facilities of a hospital. "At the time the founder started the group, he also started a hospital. The hospital and clinic were financed entirely by him. The clinic occupies the first floor of the hospital building. However, they are two separate and distinct organizations." "The group originally practiced in a hospital; 8 years later

they built their own clinic building next door." "The original building and the one in which the clinic is now located is a functioning hospital which was erected before the clinic was established. The clinic rents space from the hospital but owns its own equipment." Finally, one group reported the aid of a local industrialist: "A local industrialist was induced to build the building and the group rents from him. It is a two-story downtown construction, the entire second floor being used by the clinic."

Comment.—Apparently, several methods can be successful in providing office facilities, but in all of them it is desirable to plan for possibility of expansion. There are a few general principles that all groups should consider in providing housing: 1. Provision should be made for expansion. 2. A sound method of raising capital and amortizing the capital investment should be agreed upon. 3. If office space is rented, provision should be made that the physicians will not be squeezed by unreasonably increased rentals at an awkward time. 4. If capital is involved, provision should be made for retaining control of the building in the hands of the physicians who are using it. 5. If the clinic facilities are in, or are in intimate relation with, a hospital, all of the factors involved in such relationship should be explored. 6. If the clinic was built by a local capitalist, or a single founder, the group should be assured that it will not be put out on the street or placed in an impossible situation by present or future owners of the building.

There seems to be some trend for clinics having facilities as a part of a hospital to divorce themselves from this arrangement and build elsewhere. The reasons seem to be that they can handle their own affairs more independently and that if anyone has differences with the hospital these are not carried over to the clinic.

Current Problems

All but two of the groups replied to the question on the nature of their present problems, some giving multiple answers. These have been classified by the present size of the group. In the first category of groups of six or fewer physicians, 14 replied. Four stated that their principal difficulty was in holding good men; most added that doctors do not like to continue working on a salary without progressing to partnership. Three stated that their chief difficulty was either getting a business manager or having him accepted by the group, or by their nonmedical personnel. Two indicated that a shortage of specialists (naming otolaryngology as a specialty in which there is a shortage) was their most serious difficulty. Two indicated that conflicts between the founder or the dominant family in the group and the other physicians was the most serious current problem. Two stated that either the doctors think they work too hard or they take too much time out. Three did not list any current problems.

There were 13 in the groups having from 7 to 11 physicians. Seven of these mentioned difficulty in holding good men or in determining who is to control the group or the distaste of physicians brought on salary to remain in that capacity without progressing to partnership. Five groups mentioned such problems as difficulty with physicians' wives, over-or-under-charging patients, or inadequate hospital facilities. Three listed the problem of division of income or financial aspects as the most difficult problem. Two mentioned, specifically, educating the partners to the advantage of a business manager or getting adequate paramedical assistance. One admitted to no current problems.

In the organizations having 12 to 18 doctors there were 13 groups. Six of these stated that the principal problem was educating the physicians and their wives to the nature of clinic practice. Five listed collections, administration, or capital accounts as the principal problems; five listed inadequate space; and five, internal organization of the group. Three mentioned personality difficulties and another, employee insurance and pension plans. Four mentioned poor professional relationships with other men practicing in the community or no difficulties at all.

Finally, there were six groups with more than 18 physicians. Most of these listed several current problems. Three stated that their main difficulties have resulted from the growth of the group: "The clinic is growing larger and has become more wasteful and the physicians take a smaller percentage of what they make." "There is the problem of financing the expansion of the group." Three mentioned administrative difficulties: "Partnership is limited, primarily to one family which has strict control." "Problem of dividing responsibility among physicians instead of depending on the founder so much." Two listed finding the right physicians and two the division of income as the primary current problems. One stated that their greatest difficulty was with a hospital: "When a hospital is run along with a clinic, the hospital suffers many losses monetarily, and it takes the doctors' time to run it." One stated, "Physicians who want their own special secretary or nurse have also presented a problem."

Comment.—The similarity of current problems, regardless of the size of the group, is noteworthy. Considered in broad perspective, the most common current problem appears to be obtaining the right physicians in the group and getting them to work together, smoothly and efficiently. This is the basic attribute of those who replied "difficulty in getting the right men, difficulty in holding men, division of income, internal organization, and the like." The other categories of difficulty deal with physical facilities, that is, the space available and its location and the erection of a satisfactory administrative structure, both business-wise and professionally. In several instances, the release of the group from the too tight control of a founder or a single medical family seemed the most pressing problem. Again it seems that there is no single answer to these questions but that they are frequent and must be faced and solved if the group is to be a compatible organization over a long term.

Suggestions for Avoiding Group Problems

Only 18 gave specific suggestions on how problems of groups might be avoided. Four mentioned providing for expansion of building space: "When buying,

renting, or building a clinic the future possibilities of enlarging should be carefully looked into." "Have architects experienced in clinic design, design your clinic." "Ownership of the building by some of the partners causes trouble." "Too rapid expansion of facilities may cause the cost to cut into the income too much." Three listed care in the selection of the doctors by age, and "wives," as important: "Be careful in selecting doctors—age; ability, not only professionally; wives." "Do not add doctors too fast." "Hiring doctors on a temporary basis has caused difficulty." Three mentioned the business organization or business manager: "Obtain a well trained business manager or none at all." "Have a local attorney help in initial organization and a tax attorney advise on the business organization." "Keep minutes of every meeting, this will help clear confusion of ideas as to policy. When new men are taken on, a written contract should be signed." Two discussed the income of the physicians: "Never determine the individuals income to the group." "Never give a man a percentage of his gross income as a salary." Three talked of accounts receivable and collections: "Don't let accounts receivable get high, the higher the accounts receivable, the higher the operating costs." "Be careful of collections, bill every 30 days." "Do not undercharge." One group felt they made a mistake in charging only what other doctors in the community did: "They raised their fees and found they were getting more business." Finally, three gave miscellaneous suggestions: "Be careful in hiring personnel for they are the largest part of the overhead." "Be sure adequate insurance is carried for all risks." "Keep a reserve fund."

Comment.—Most of these suggestions seem to be entirely sound as far as they go. Judging from what the original problems of these groups were and what they are now, however, the suggestions do not appear to cover all that might be said on this subject.

Methods of Compensation of Physicians

Because of the vital importance of division of income to the well-being of physicians in a group, most of the replies to this question are given in full. Although it is difficult to classify accurately the methods used, six major categories are presented with examples of replies received from groups in each category. In addition, because of its interest to younger men joining a group practice, the method of progression of junior physicians in 17 of the groups is given in detail.

Point System.—Replies of four groups who used a point system for division of income are given below. One group stated that all physicians, partners, and employees are judged for payment on a point system. One hundred points may be allocated to one man depending on (1) seniority, (2) dollar income to the clinic, and (3) importance to the group. Partners receive special consideration in points because of their responsibilities of ownership. A point committee of three members reviews the points every three months.

Another group stated that net income is divided on a point formula. Each doctor receives a base pay of $600 plus $25 additional per month for each year he has been with the group. (If the doctor has his boards, he starts with $700 with $25 added per month.) The balance is determined by points. The cases the doctor takes care of determine 50% of the points, and the dollar income on the books determines 50% of the points. The points are added for all doctors and the percentage of the individual doctor is secured, which percentage is each doctor's portion of the undistributed balance of the net profit at the end of the year.

In a third group, it was stated that all partners are equal and have the same monthly drawing account, which is approximately one-half of the total earnings. The balance is distributed quarterly as a division of profits under this plan; once per year there is an annual division. The plan consists of equality, incentive (recognition being given to bookings), tenure (at the end of two years, doctors start earning tenure points at the rate of four points per year for five years), cost accounting for expenses, and a recognition of the dollar value per patient of the different specialties (this is also based on points: 30 points for internists, pediatricians, and like specialists and 20 points for radiologists, surgeons, and surgical specialists). In the fourth group, division of income is based on a point system that is a combination of the production and the time the doctor has been with the group. Both salaried physicians' and partners' incomes are determined by this method. However, the partners receive a much larger percentage of the surplus.

Division Based Mainly on Total Bookings.—Replies of four groups whose method of division of income was based mainly on total bookings are given below.

In one group, division of partnership percentage is determined by bookings, and advances are made monthly against annual distribution. In a second group, each month the total bookings are secured, percentage of bookings of each doctor is found, and two-thirds of the net is distributed according to these percentages. The remaining one-third of net is divided equally among all partners. This is the way of compensating the general practitioners and internists for examining patients for the surgeon.

In another group, the individual doctor's percentage of booking to all bookings is determined, and the net profit after expenses is found; 75% of this net profit is distributed monthly, based upon the individual percentages. The other 25% is withheld until the end of the year, when it is distributed in equal shares to all partners. In a fourth group, after the net income is determined, 40% of this is divided equally among all partners. The remaining 60% is divided according to the amount of business each doctor has put on the group books.

Set Percentage Distribution of Income (Not Equal).—The following replies are from groups in which partners have a set percentage distribution of income (not equal).

In one group, the partnership is a 60-40 proposition; one partner gets 60%; the other partner 40% of the net earnings. Against this they have a drawing

account. In a second group, one of the partners receives 30% of all the gross surgical income and the other gets what remains after all clinical expenses are paid. The latter partner is the medical director and receives a salary from the foundation that had financed the clinic for his services as executive director of the foundation. In another group, the senior partner owns 57.5%, one partner 22.5%, and the third partner 20%. If a new man should start, at the end of the five-year progression period, he would share equally with the senior partners. The reason why the present partners are not equal is because of their ages and of their length of practice in the community. In a fourth group, the founder owns five-eighths and three doctors each have one-eighth. There is really no partnership agreement; each doctor is on a separate contract between himself and the founder.

Salaries Decided by Executive Committee and Partners.—Replies given below are from groups in which salaries are decided by an executive committee and partners. In one group the executive committee made up of three members decides the division of net profit between the partners. This is subject to appeal to the entire partnership, which consists of six partners. In a second group the salaries are determined by the board of trustees. They are determined by need (i. e., children, sickness, and family support), and a physician's income has no relationship to relative position in the group, to his shares, or to seniority. Raises across the board are given periodically, depending on the group income. The ultimate goal is to pay all department heads the same salary, with the members of the department receiving salaries less than that as determined by need. (Top salary is now $15,500. Estimated salary for department heads is $18,000.)

In another group, salaries are set by the executive committee and are based on five factors: (1) whether a man is a department head, (2) whether he is a diplomate of a specialty board, (3) years of practice, (4) the years he has been with the clinic, and (5) his general value to the clinic. In a fourth group, the partners determine among themselves how much each partner is to receive. Each one has a drawing account to use during the year. At the end of the year, the excess is divided or kept in the organization.

In the fifth group, a member's salary is determined by an annually elected salary committee made up of four members, which reviews the salaries each year. The salary committee draws up a proposed schedule of salaries and gives a copy to each member. If the physician does not like the salary designated for him, he may request a hearing with the committee, or with a combination of the executive and salary committees. Salaries have nothing to do with the volume of business that each man does but necessarily reflect the volume of work done by the group as a whole. A man's salary increases periodically until, at the age of 40 and with 10 years of service with the clinic, he reaches a maximum salary of $40,000.

Equal Division Among All Senior Partners.—Twenty-six of the groups, ranging in size from 3 to 24 physicians and varying from 1 to 51 years in existence, stated that all senior partners shared equally in the income. It is difficult to draw conclusions from such statements, however, without knowing how many of the physicians in the group were senior partners. It is possible, for example, that in the largest group of 24 there are only 4 or 5 senior partners and all the rest are junior partners or employed physicians. Such information would materially affect the interpretation of this reply and perhaps can be obtained later.

Division Among All Senior Partners, with One Exception.—The reply from one group stated that a group of five men share equally in the partnership. One woman, however, receives a lesser share. In another group, the partners share equally, with the exception of the senior partner of the four. He does approximately 75% of all the surgery done by the clinic, and because of this he is paid a small salary before the net of the group is divided equally. In a third group, the division of income among full partners is equal, with the exception of one, who receives 5% less than the others. It is based entirely upon the amount of money invested in the clinic. In a fourth group, before any of the income is distributed, 20% of the gross is divided among the building partners according to percentage of ownership in the building. This is in lieu of rent. After the 20% gross is taken out, the operating expenses of the group are then deducted, and the remainder is divided equally among all partners, including the building partners.

Junior Partner Percentage Progression.—The method of progression of junior physicians in 17 of the groups is as follows: 1. Physician remains a junior partner indefinitely. 2. A partner is put on a progressive scale from one year to three. The second year he receives about one-half of what the senior partners get, and, at the end of the third year, he receives full participation. 3. The progression period varies; a board man is given a contract for 7 years, and a nonboard man for 10 years. The first year a physician is employed, he is on probation and receives a straight base salary. After that he begins to receive a percentage of the equal shares in the profits. This percentage increases year by year until, when he becomes a partner, he receives a full share of the profits. The base pay of obstetricians and surgeons increases from $6,000 to $10,000 over a four-year period. Other physicians' base pay remains at $6,000. 4. A physician is a junior partner for five years, before he is brought into full senior partnership. He receives a percentage of the total partner's wage plus the same percentage of the profits. This percentage increases year by year at an increasing rate until, at the time he becomes a full senior partner, he gets a full and equal share of the wages and profits. 5. On becoming a junior partner, after one year on salary, a physician receives 65% of the senior partner's share; the third year, 70%; fourth year, 80%; fifth year, 90%; sixth year, 95%; and, at the end of the sixth year, he becomes a senior partner and shares equally with all other senior partners. 6. It takes a physician 11 years after joining the group to become a senior partner. The first year he is on salary, at the end of which time he is put on as a junior partner and his salary is increased 5% per year. The senior partners are on a 50-50 basis.

7. During the one year of probation, the physician receives a salary of $900 per month, which remains his base even after becoming a partner. At the end of his year of probation, on the vote of three-fourths of the membership, he becomes a one-fourth–share partner and receives one-fourth of a full bonus. At this time his salary plus bonus amounts to about 50% of that of a full partner. A physician must spend one year as a one-fourth–share owner, two years as a one-half–share owner, three years as a three-fourths–share owner, and then he may become a full partner. Each one-fourth share costs $5,000, which is paid by applying 50% of each month's bonus money to the debt. 8. A physician works three years on salary and two years as a junior partner. He becomes a senior partner after five years. A new physician receives $10,000 the first year; after that it is increased $1,000 per year. Junior partners have a drawing account plus an increasing percentage of the profits.

9. A junior member invests in the organization and shares in the profits but has no vote. After two years he gets three-fourths the vote of a senior member and gets the full vote in another year. His vote is increased by one vote approximately each five years until he has a total of five votes as a maximum at the age of 60. His investment must be equal in amount to the investments of all the other men. 10. A physician goes on salary for two years, after which time he becomes a junior partner. A junior partner starts at one-half of the senior partners' percentage and progresses to the sixth year, at which time, if he is a board man, he becomes a senior partner. If he is not a board man, he does not become a senior partner until the end of the eighth year of junior partnership. 11. The new physician serves one year of probation. During the first year of partnership, men with no special training receive 60% of the salary received by the full partner. This is increased to 70% during the second year, 75% during the third, 80% during the fourth year, and the salary is equal to all other partners from then on. A board-certified radiologist receives 85% of a full partner's income during his first year and from then on shares equally. Any other board-certified or board-eligible partner receives 70% during his first year, 80% during his second year, and then shares equally.

12. When the partners feel that a man's contribution to the income of the group is sufficient, he may buy half a share of the partnership and receive half the salary of a full partner. This half share, though it varies, at this time costs $28,800. When a man is a half-partner, he owns two shares in the clinic, and after he has paid for them, if it is felt that his worth to the partnership has increased, he may invest more and become a three-share or a four-share owner and thus become a full partner. A man is not allowed to invest any more than he is worth to the partnership. 13. Physicians have one year on salary before becoming junior partners, and, after three years of junior partnership, they have full participation. Physicians are employed at $1,000 per month and receive that amount for the one-year period on salary. 14. The new doctor is put on a salary for one year, at $1,000 a month. At the end of the year he becomes a junior partner. He is kept on the junior partner status for a period of two years, at which time he becomes a full partner and shares equally with the other partners.

15. This group has the unusual plan of requiring a doctor to be 10 years on salary before becoming a partner. During these 10 years his salary increases $1,200 per year starting at $10,000. When he becomes a partner he does not have to buy into the capital assets of the group. The capital assets are held as a partnership asset. Partners share equally. 16. There is a five-year schedule for any new man. He is put on salary for the first year, after which he is a junior partner for four years, and then becomes a partner and shares equally. 17. After being on salary for two years, the doctor then becomes a junior partner for five years with a percentage increase from year to year. At the end of five years, all partners share equally. On all matters that require a vote in the partnership meetings, the junior partner is permitted one vote while the senior partners are permitted two votes.

Comment

It is obvious from the replies given that several different methods of division of income are in effect and that there is no single pattern that has yet emerged as being outstandingly "best." In general the method of equal division of income between physicians in a group appears to work fairly well if the senior partners who are receiving the equal division are of approximately the same age and capacities and lacking in personal jealousies. In larger groups, in which there is considerable variation in earning power by reason of age, specialty, amount of work done, and like factors, it often becomes difficult to continue such equal division.

Comparatively few of the groups base the income of the physicians on bookings alone. This illustrates the point that has been frequently raised about group practice, namely, that it should be a team activity and that physicians in groups are peculiarly dependent on each other for their professional earning capacity. Furthermore, as has been pointed out on numerous occasions, when the incomes of physicians in groups are based exclusively on bookings of the individual, in essence each physician is continuing to practice independently, though under one roof.

The other sections of this report indicate that the methods of division of income employed are not necessarily completely satisfactory to the physicians involved. Consequently, many groups frequently reconsider the method that they use in such division; the general tendency in established groups seems to be for a departure both from completely equal sharing and from income based on bookings alone and toward the use of multiple criteria along the lines of the point system or by salary determined by an executive committee on the basis of similar criteria.

MEDICAL NEWS

CALIFORNIA

Grant in Neurosurgery.—A $52,000 grant has been awarded the Mount Zion Hospital Neurosurgical Institute, San Francisco, by the U. S. Air Force for neurophysiological studies in deep-brain structure. The one-year grant, which will be for both research and treatment, is to cover special electronic equipment. Installation of this special equipment is expected to be completed by the end of summer.

Soiland Memorial Lecture.—The Albert Soiland Cancer Foundation announces that the fifth annual Soiland Memorial Lecture, "Treatment of Cancer of the Breast," will be given by Dr. François Baclesse of Paris, France, at 8 p. m., Aug. 10, in the auditorium, Los Angeles County Medical Association, 1925 Wilshire Blvd., Los Angeles. Physicians are cordially invited to attend. Dr. Baclesse is chief of service (roentgen therapy) at the Foundation Curie (Institut du Radium); honorary radiotherapist, American Hospital, Paris; and honorary member of the American Radium Society.

Personal.—Dr. Etta S. Lund, Willows, was honored at a "50 Golden Years" reception sponsored by the Glenn General Hospital Auxiliary and other Willows organizations.——Dr. Hyrum C. Crockett, Hayward, a past-president of the Alameda Medical Association, was recently chosen as outstanding citizen of the year by the Hayward Lions Club.——Dr. William P. Longmire, professor of surgery, University of California at Los Angeles School of Medicine, has been made honorary professor of surgery at the Free University of Berlin in recognition of his contributions to its surgical program. Dr. Longmire served as visiting professor at the Free University while on active duty with the U. S. Air Force in Europe.——Dr. Ronald Reuben, assistant clinical professor in pediatrics, University of California at Los Angeles School of Medicine, has been named chief of staff for the Sunair Foundation for Asthmatic Children, a nonprofit organization that maintains a home in Tujunga for needy asthmatic children. Dr. Reuben, a staff member of Cedars of Lebanon, University of California at Los Angeles, and Los Angeles County hospitals, serves in the university's Allergy Clinic.——Dr. Vincent C. DiRaimondo, an assistant research physician in the metabolic unit, University of California Medical School, San Francisco, has been awarded a five-year scholarship by the John and Mary R. Markle Foundation, which will provide $30,000 toward his support or research, or both. Under the supervision of Dr. Peter H. Forsham, director of the unit, Dr. DiRaimondo has helped to develop new procedures for estimation of the potency of corticotropin and other preparations used in the treatment of rheumatic diseases.

DELAWARE

Society News.—The Delaware Psychiatric Society recently elected Dr. William A. Byrne, Wilmington, president; Dr. H. George DeCherney, Farnhurst, vice-president; and Dr. Walter D. Davis, Wilmington, secretary-treasurer.

Dr. Gehrmann Honored.—Dr. George H. Gehrmann, Chadds Ford, Pa., former medical director of the duPont Company in Wilmington, was awarded the ninth Alumni Medallion for Distinguished Service to American Medicine by the State University of New York College of Medicine at New York City, Brooklyn, during commencement exercises June 7. Dr. Gehrmann was cited for his contributions to the health of workers in industry, for leadership over more than 40 years in industrial medicine, and for bringing about the collaboration of industry and medicine to protect and preserve the health of the American worker. Dr. Gehrmann, who reached the mandatory retirement age in 1955, has been credited with creation of the American Academy of Occupational Medicine. He was also one of the leaders in the effort to raise professional and educational standards that culminated in the establishment of a specialty board in occupational medicine in 1955.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

ILLINOIS

Funds Donated to Medical Society by High School Students.—The student councils of the Quincy Senior and the Notre Dame of Quincy high schools have given the Adams County Medical Society $130, the balance of funds in their treasuries following the activities of the 1956 senior classes. These funds, which have been turned over to the public relations committee of the medical society, will be used to erect for each of these high schools a permanent health exhibit, which will be kept up-to-date by the health education bureau of the Adams County Health Department, under the supervision of the medical society committee.

Chicago

Award to Dr. Davidsohn.—Dr. Israel Davidsohn, head, department of pathology, Chicago Medical School, received the Dr. Morris L. Parker award at the 42nd commencement of the school, June 16. The $500 award was conferred on him for his research in pathology, particularly as related to blood and immunology. Dr. Davidsohn is a past-president of the Chicago and Illinois Pathological societies. He is director of research, Mount Sinai Medical Research Foundation; pathologist and director of laboratories, Mount Sinai Hospital (affiliated with the school as a teaching hospital); and resident consultant, Armed Forces Institute of Pathology, Washington, D. C.

University News.—Dr. William R. Barclay, who has been with the University of Chicago Clinics since 1948, has been promoted to the rank of associate professor of medicine.——Following a tradition initiated by the senior class of 1954, the present graduating class of the Chicago Medical School is pledging a gift of $68,000 to the school.——Dr. Theodore N. Pullman, who has been associated with the University of Chicago since 1944, has been promoted to an associate professorship of medicine, as has Dr. David W. Talmage, who has been affiliated with the medical school since 1952.——Dr. J. Frederick Bell, who has been associated with the U. S. Public Health Service, stationed at Rocky Mountain Research Laboratory in Montana, is joining the medical staff of the University of Chicago to direct viral and rickettsial fever research for the Navy at Cairo, Egypt.——Dr. Charles P. McCartney, who has been associated with the University of Chicago since 1943 except for three years in the United States military services, has been made associate professor of obstetrics and gynecology at the school of medicine.——Dr. R. Hugh Dickinson has been named associate professor in psychiatry at the University of Chicago Clinics. For over five years Dr. Dickinson has been in Omaha, where, besides private practice, his activities included a half-time position at the University of Nebraska College of Medicine as associate professor and assistant director of the Nebraska Psychiatric Institute in charge of training and education. Also for five years he has taught graduate students in the field of social work and has been consultant to the Family and Children's Service Agency in Omaha.

KANSAS

Dr. Bearg Accepts Philadelphia Appointment.—Dr. Philip A. Bearg, Topeka, who has served the state health department as a pediatric consultant in the maternal and child health division and as state epidemiologist, has been appointed professor of public health at Jefferson Medical College of Philadelphia and director of the Fife-Hamill Memorial Health Center. Dr. Evalyn S. Gendel, Topeka, who has assisted Dr. Bearg with the poliomyelitis vaccine program, will be responsible for poliomyelitis vaccine distribution.

KENTUCKY

Personal.—Dr. Annie S. Veech and Dr. Alice N. Pickett, retired Louisville physicians, received the achievement award of the Alumnae Association of their alma mater, the Woman's Medical College of Philadelphia, June 6. Dr. Pickett was head of the obstetrics department of the University of Louisville School of Medicine for 25 years. Dr. Veech organized and was head of Kentucky's first maternal and child health program.

Society News.—The University of Louisville School of Medicine in cooperation with the Kentucky State Medical Association and the Kentucky Academy of General Practice sponsored a commencement postgraduate seminar at the Louisville General Hospital, June 4. The following Louisville physicians spoke at the seminar: J. Murray Kinsman, dean of the school; Douglas M. Haynes; William M. Christophersen; Beverly T. Towery; Hugh B. Lynn; Rex O. McMorris; and Frank Falkner.—Dr. Clyde C. Sparks, Ashland, immediate past-president of the Kentucky State Medical Association, moderated a panel discussion at a meeting of the Kentucky Federation of Women's Clubs, June 5, in Louisville. Panel members were Drs. W. Clark Bailey, Harlan, A. M. A. delegate; Garnett J. Sweeney, Liberty, Kentucky State Medical Association councilor and former chairman of the committee on general practice; J. Duffy Hancock, Louisville, past-president of the Kentucky State Medical Association and former A. M. A. delegate; and W. Vinson Pierce, Covington, A. M. A. delegate. The discussion concerned the contributions that the medical profession makes to freedom.

MASSACHUSETTS

Dr. Meigs Honored.—On April 23, the Joe Vincent Meigs Conference Room was dedicated at the Vincent Memorial Hospital, Boston, by Mr. Louis Curtis, chairman of the board of trustees of the hospital, and Dr. Meigs' portrait was unveiled by Dr. Langdon Parsons, professor of gynecology at Boston University School of Medicine. The portrait, painted by Alfred Jonniaux, former Belgian court painter, was given to the hospital by a group of Dr. Meigs' former assistants, including Dr. Parsons, Dr. Somers H. Sturgis, chief of the gynecology service at Peter Bent Brigham Hospital, Dr. John McLean Morris, associate professor of gynecology at Yale University, and Dr. Howard Ulfelder, present chief of staff of the Vincent Memorial Hospital and other members of the hospital staff. Dr. Meigs joined the staff of Vincent Memorial Hospital in 1921 and, in 1930, was the first man to be appointed chief of staff. He became the first chief of the gynecology service at Massachusetts General Hospital in 1941. He retired from these two posts on June 30, 1955, while continuing his teaching as clinical professor of gynecology at Harvard Medical School. Dr. Meigs is further honored by the fact that funds are now being raised to endow a chair at the Harvard Medical School in his name.

MICHIGAN

Bequest for Medical Education.—The late Dr. Henry A. Luce of Detroit, past-president of the Michigan State Medical Society, who died Oct. 28, 1955, bequeathed $1,000 to the Michigan Foundation for Medical and Health Education, earmarked for psychiatric research and study. Dr. Luce had been active in the work of the Michigan Foundation, having been one of its original members.

Dr. Mellins Accepts New York Appointment.—Dr. Harry Zachary Mellins, assistant professor of radiology, Wayne University College of Medicine and head of the radiology department at Sinai Hospital in Detroit, has been named chairman of the department of radiology at the State University of New York College of Medicine at New York City, Brooklyn, and director of radiology at Kings County Hospital. A graduate in 1944 of the Long Island College of Medicine (now State University of New York College of Medicine at New York City, Brooklyn), Dr. Mellins was formerly a postgraduate fellow of the Atomic Energy Commission and assistant professor of radiology at the University of Minnesota Medical School, Minneapolis.

MISSOURI

Chair of Child Psychiatry Endowed.—The Washington University School of Medicine, St. Louis, has received from the Ittleson Family Foundation $400,000 to endow the Blanche F. Ittleson Chair of Child Psychiatry, said to be the first endowed professorship of child psychiatry in the United States. The Ittleson Family Foundation was established in 1932 by the late Henry Ittleson, founder of the C. I. T. Financial Corporation, "for the promotion of the well-being of mankind throughout the world, including as means to that end, research, publication, the establishment and maintenance of charitable, religious and educational activities, agencies, and institutions, and the aid of any such activities, agencies, and institutions already established." Mrs. Ittleson, widow of the founder, has worked for many years to establish programs that would develop the mental, psychological, and emotional health of children and adults. In 1954 she was U. S. representative at the annual meeting of the World Federation for Mental Health in Canada, and last year, shortly before her 80th birthday, she flew to Istanbul, Turkey, to attend the annual meeting of the federation, as representative of the National Association for Mental Health, the Menninger Foundation, and the Austen Riggs Center.

Personal.—Dr. Bernard Becker, head, department of ophthalmology, Washington University School of Medicine, St. Louis, has been selected as recipient of the 1956 Edward Lorenzo Holmes award of the Institute of Medicine of Chicago, in recognition of his work on the pathological physiology of glaucoma and the relationship of adrenal steroids to diabetic vascular disease.—At the annual meeting of the Missouri Social Hygiene Association, Dr. Jules H. Kopp, St. Louis, was presented an honorary life membership in the American Social Hygiene Association in recognition of nearly 20 years of service to the public welfare. Dr. Kopp has been active in promoting the prenatal and premarital blood test laws in Missouri and in developing a social hygiene program in the St. Louis high schools. He is a past-president of the Maryland School Parent-Teachers Association and was a member of the Clayton P. T. A. Council.

NEBRASKA

Crippled Children's Clinics.—Crippled Children's Clinics have been scheduled for Aug. 11 at the high school, O'Neill, and for Aug. 28 at the Elks Club, Broken Bow.

Promoted to Professorship.—The University of Nebraska College of Medicine, Omaha, has announced the following promotions from associate professorship to professorship: Herbert Paul Jacobi, Ph.D., to professor in the department of biochemistry, of which he is chairman; Dr. Joseph Daniel McCarthy to professor of internal medicine; Dr. Harry W. McFadden to professor of microbiology, continuing as chairman of that department; and Dr. Ralph C. Moore to professor of radiology.

NEW YORK

Radiation Record Program.—In accordance with a recommendation of the National Academy of Science, that "records should be kept for every individual showing his total accumulated lifetime exposure to radiation," the New York State Radiological Society is preparing exposure record cards that will be distributed to members of the society and made available to all radiologists practicing in the state and to hospitals. A table of typical x-ray exposures indicating the radiation dose to the patient is also being prepared to assist physicians in filling out the record cards. The card may be given to the patient after each x-ray examination to serve as a permanent record of his exposure. Blank spaces will be provided for future entries. The society has been engaged in a program of education and of cooperation with the New York State Department of Health to keep within acceptable limits the x-ray exposure of patients and medical personnel.

Dr. Browder Honored.—A testimonial dinner was given at the Brooklyn Club, June 15, in honor of Dr. E. Jefferson Browder by 23 former residents of the neurosurgical service at Kings County Hospital. Dr. Browder is professor and chairman of neurosurgery at the State University of New York College of Medicine at New York City, Brooklyn, and director of neurosurgery at the Kings

County Hospital. He has been on the college faculty since 1925 and on the hospital staff since 1928. A portrait of Dr. Browder was presented to the hospital and the college of medicine for the group by Dr. H. Russell Meyers, professor of surgery and neurosurgery at the State University of Iowa College of Medicine, Iowa City. The portrait was accepted for the hospital by Dr. Israel Magelaner, superintendent, and for the college by Dr. Howard W. Potter, dean. Painted by the artist Guiseppe Trotta, the portrait will probably be hung in the lobby of the "E" building at Kings County Hospital.

New York City

Bancroft Lecture.—The Alumni Association of Beth David Hospital presented the annual Frederic W. Bancroft Lecture in Surgery June 7. Dr. Louis M. Rousselot, director of surgery, St. Vincent's Hospital, and professor of clinical surgery, New York University College of Medicine, had as his subject "Application of Portal Portography in Studies of the Portal System and Application in Surgery of Portal Hypertension."

Group for Study of Diabetes.—New York University–Bellevue Medical Center announces that a group for the study of diabetes has been formed under the direction of Dr. Elaine P. Ralli, who started the first diabetic clinic at Bellevue Hospital in 1928. Dr. Ralli is medical director of the outpatient services of the New York City Department of Hospitals and associate professor of medicine at New York University College of Medicine. Mary E. Dumm, Ph.D., assistant professor in the department of medicine, who is responsible for the experimental aspects of the program, is assisted by several research technicians.

Courses in Physical Rehabilitation.—The Institute of Physical Medicine and Rehabilitation, New York University–Bellevue Medical Center, 400 E. 34th St., will offer a three-week seminar in physical rehabilitation methods for nurses, Oct. 22-Nov. 9, 1956; Jan. 7-25 and March 25-April 12, 1957. The course is designed for registered nurses in the hospital as well as in the public health fields. Tuition is $75 for the seminar and $25 weekly for additional clinical observation, practice, and field trips. The institute will also offer a four-week advanced course in physical rehabilitation methods for physical therapists, Nov. 19-Dec. 14, 1956; Feb. 4-March 1 and April 29-May 24, 1957. Tuition is $100 ($25 per point of either undergraduate or postgraduate credit); registration, $7. Qualified veterans may enroll in the course under the provision of P. L. 346 or P. L. 16. Applications and requests for further information may be submitted to Mrs. Edith Buchwald Lawton, Director of Rehabilitation Courses for Physical Therapists, Institute of Physical Medicine and Rehabilitation, 400 E. 34th St., New York 16.

Personal.—Dr. A. Allen Goldbloom on March 9 addressed the Tucson (Ariz.) chapter of the Arizona Medical Laboratory Association, his subject being "Newer Laboratory Techniques."—Dr. Paul F. Russell, formerly staff member of the Rockefeller Foundation and consultant to the World Health Organization, delivered a public lecture on "Some Aspects of Malaria Eradication" April 5 at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore. This was one of the De Lamar Lectures in Hygiene.—Dr. Brittain Ford Payne, clinical professor of ophthalmology, New York University College of Medicine, was recently elected president of the Pan American Association of Ophthalmology, which he has served as assistant secretary since 1948. Dr. Payne is executive surgeon and director of clinics and pathology at New York Eye and Ear Infirmary and director of ophthalmology at Lenox Hill Hospital.—Dr. Geoffrey W. Rake was recently appointed scientific director of the International Division of Olin Mathieson Chemical Corporation, a position that carries responsibility for all pharmaceutical, medical, and veterinary research conducted outside the United States by the company's Squibb International Division. Since 1953 Dr. Rake has served as medical research consultant to the E. R. Squibb & Sons Division of Olin Mathieson and as research professor of microbiology at the University of Pennsylvania schools of medicine and veterinary medicine in Philadelphia. Previously he was director of the Squibb Medical Division and director of the Squibb Institute for Medical Research.

Dr. Rous Awarded Medal.—At the annual meeting of the National Academy of Sciences, April 23-25 in Washington, D. C., the Kovalenko medal was awarded to Dr. F. Peyton Rous, editor of the *Journal of Experimental Medicine* in honor of his contributions to experimental medicine, notably his early observation of an association between viruses and tumor growth and his work on the physiology and pathology of the liver and the physiology of the blood vessels. The Kovalenko medal, for outstanding contributions to medical science, was established in 1949 by Michael S. Kovalenko, Ph.D., in memory of his wife, Jessie Stevenson Kovalenko.

OHIO

Dr. Higgins Honored.—Dr. Charles C. Higgins, Cleveland, received the Keyes medal at the recent meeting of the American Association of Genito-Urinary Surgeons at Oyster Harbors, Mass.

William H. Muhlberg Lecture.—Beginning in 1956, the joint biennial meetings of the council on diabetes of the Public Health Federation and the Academy of Medicine of Cincinnati will be under the auspices of the William H. Muhlberg Lecture, established by the Union Central Life Insurance Company. The first lecturer will be Dr. Francis D. Lukens, Philadelphia. Dr. Muhlberg, who in 1916 became medical director of the Union Central Life Insurance Company, was the recipient in 1945 of the Public Health Federation's health award for rendering distinguished service to the cause of public health in greater Cincinnati. In recognition of his contributions and his work as a loyal and faithful member of the Cincinnati Board of Health, the new health center at 3845 Wm. P. Dooley By-Pass was dedicated as the Wm. H. Muhlberg Health Center in 1955. Dr. Muhlberg was instrumental in the founding of the American Diabetes Association and served as its first treasurer.

Personal.—At the invitation of the Russian minister of health, Dr. Albert B. Sabin, Cincinnati, recently spent four weeks in Russia, where he participated in the 13th All-Union Congress of Epidemiologists, Virologists, Microbiologists, and Hygienists. On July 26 Dr. Sabin addressed the International Congress of Pediatrics in Copenhagen, where he discussed "The Present Status of Work on Immunization of Human Beings with Live Attenuated Poliomyelitis Viruses." Dr. Sabin is professor of research pediatrics at the University of Cincinnati College of Medicine and a fellow the Children's Hospital Research Foundation.

OREGON

Fund for Research.—A trust fund consisting of securities valued at approximately $200,000 has been established for research at the University of Oregon Medical School, Portland. The fund, named in honor of Dr. Laurence Selling, professor emeritus of medicine at the medical school, was established by an anonymous friend of the school. Income from the money is to be devoted to research projects designated by the dean.

Personal.—At its annual banquet in Portland the University of Oregon Medical School Alumni Association presented to Dr. Herbert M. Greene, '04, Portland, its Citation of Meritorious Achievement for having "dedicated more than half a century of service and sacrifice to the alleviation of human suffering." Other graduates of 50 years ago or more who received awards but were not present at the banquet were Dr. George W. Tamiesie, '02, Portland, Dr. Frank E. Brown, '00, Salem, and Dr. John G. Patterson, '03, Klamath Falls.

Fulbright Award to Physiology Head.—A Fulbright scholarship has been awarded to John M. Brookhart, Ph.D., professor and head of the department of physiology at the University of Oregon Medical School, Portland, for a year of study with Dr. Giuseppe Moruzzi at the University of Pisa, Italy. Dr. Brookhart and his family plan to sail from New York Aug. 22 and will return to the United States in March, 1957. While at the University of Pisa, Dr. Brookhart will conduct research in neurophysiology with particular emphasis on mechanisms controlling neuronal discharge.

PENNSYLVANIA

Flick Anniversary.—The 100th anniversary of the birth of Dr. Lawrence F. Flick, Philadelphia, a pioneer in the tuberculosis control movement in the United States and a founder of the National Tuberculosis Association, will be commemorated in his birthplace, Carrolltown, on Aug. 11. Those wishing to participate in this observance may obtain additional information from the Cambria County Tuberculosis and Health Association, Johnstown.

Philadelphia

Turnoff Memorial Lecture.—Dr. Tinsley R. Harrison, professor of medicine, Medical College of Alabama, Birmingham, gave the first annual David Turnoff Memorial Lecture, "Treatment of the Patient with Angina Pectoris, Clinical Research and Practical Aspects," May 2 at the Benjamin Franklin Hotel. This lectureship is sponsored by the Kensington Hospital of Philadelphia in honor of its first chief of medicine, Dr. David Turnoff, who died in 1953. Dr. Harrison also moderated a panel discussion, "Use of Digitalis, Quinidine, and Allied Drugs." Other members of the panel included Drs. Louis A. Soloff, Calvin F. Kay, Samuel Bellet, and William Likoff. The arrangements for the affair were under the direction of Drs. Saul P. Bralow and Morris W. Yarrow.

Society News.—Dr. Jacob Zatuchni was recently elected president and Dr. Fred B. Rogers secretary of the Temple University chapter of the American Federation for Clinical Research, founded 15 years ago "to stimulate among young workers a persisting interest in investigation in clinical and allied medical sciences." Dr. Charles R. Shuman, also of the medical school faculty, is currently chairman of the eastern section.

TEXAS

University News.—Dr. John B. Truslow, former dean of the school of medicine, Medical College of Virginia, Richmond, was recently made executive director of the University of Texas Medical Branch at Galveston, succeeding Chauncey D. Leake, Ph.D., who resigned last August to become assistant dean of the college of medicine and professor of pharmacology at Ohio State University, Columbus. As executive director of the University Medical Branch, Dr. Truslow administers a program for more than 1,100 students, 2,200 staff members, and 7 hospitals.

Medical Teaching Grant.—A $500,000 grant for medical teaching and research has been presented to the University of Texas by the William Buchanan Foundation of Texarkana, the major portion for use at Southwestern Medical School, Dallas. The bulk of the grant is to be allocated for "training programs, postgraduate programs, teaching programs, fellowship and scholarship programs, and research in medicine, public health, sanitation, nursing, and related medical fields"; $38,000 is the balance of a $69,000 commitment made earlier to assist Southwestern in research and study of tuberculosis and related diseases in children.

WISCONSIN

Personal.—Dr. Anthony V. Pisciotta, assistant professor of medicine, Marquette University School of Medicine, Milwaukee, received the "Enceania" award June 12 in New York City as the member of his graduating class best exemplifying the ideals of Fordham University, New York.—Dr. Vaughan P. Simmons, assistant professor of pharmacology, Marquette University School of Medicine, Milwaukee, has been appointed assistant medical director of the Northwestern Mutual Life Insurance Company. Dr. Simmons has been associated with the medical school for the past six years.

Joint Recipients of Pasteur Award.—Joshua Lederberg, Ph.D., assistant professor of genetics, University of Wisconsin, Madison, and Esther Lederberg, Ph.D., his wife, have been named the first joint recipients of the Pasteur award, made annually by the Society of Illinois Bacteriologists. The Lederbergs were selected to receive the award "in recognition of their outstanding contributions to microbiology, particularly for their fundamental studies in bacterial genetics." With Prof. Edward L. Tatum, Ph.D. (now of Stanford University, San Francisco, but then at Yale University, New Haven, Conn.), Professor Lederberg pioneered in studies of sexual recombination in bacteria and discovered that individual bacteria could combine their genetic traits and that combined traits were then transmitted to offspring. Since announcement of this work in 1946, the Lederbergs have continued research into the genetic mechanisms by which recombination is accomplished.

GENERAL

Grant in Muscular Dystrophy.—Under the joint sponsorship of the University of Texas Medical Branch in Galveston and the National Muscular Dystrophy Research Foundation, a five-year, $250,000 research project will be initiated at the Medical Branch by M. Mason Guest, Ph.D., consultant for the Medical Branch hospitals and chairman of the department of physiology, and a committee of nine medical department men, using the teamwork approach. Simultaneously the Medical Branch will set up the first muscular dystrophy clinic in the southwestern region of the United States. The National Muscular Dystrophy Research Foundation has its headquarters at 709 Main St., Liberty, Texas. Dr. Charles T. Stone Sr., professor of the Medical Branch's department of internal medicine, is chairman of the foundation's medical advisory board. The foundation was established in 1944 by Misses Sallie and Nadine Woods for the benefit of victims of muscular dystrophy.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States and its territories and possessions in the weeks ended as indicated:

Area	July 7, 1956: Paralytic Type	July 7, 1956: Total Cases Reported	July 9, 1955, Total
New England States			
Maine	..	..	2
New Hampshire	..	..	..
Vermont	2	2	3
Massachusetts	..	1	24
Rhode Island	..	..	..
Connecticut	..	2	5
Middle Atlantic States			
New York	2	5	25
New Jersey	1	3	3
Pennsylvania	..	3	7
East North Central States			
Ohio	1	11	14
Indiana	4	10	6
Illinois	17	35	5
Michigan	..	4	18
Wisconsin	..	2	6
West North Central States			
Minnesota	1	1	13
Iowa	1	5	11
Missouri	2	6	4
North Dakota	..	2	3
South Dakota	..	..	3
Nebraska	..	1	3
Kansas	1	2	3
South Atlantic States			
Delaware	1	1	3
Maryland	1	1	7
District of Columbia	..	..	1
Virginia	..	1	7
West Virginia	1	1	2
North Carolina	4	6	8
South Carolina	1	3	12
Georgia	1	2	6
Florida	3	6	3
East South Central States			
Kentucky	..	9	5
Tennessee	1	1	10
Alabama	..	..	8
Mississippi	7	12	..
West South Central States			
Arkansas	3	5	5
Louisiana	16	19	8
Oklahoma	2	10	12
Texas	19	49	76
Mountain States			
Montana	..	..	1
Idaho	2	2	7
Wyoming	1	1	..
Colorado	2	4	2
New Mexico	3	5	8
Arizona	1	4	..
Utah	..	1	..
Nevada	..	1	4
Pacific States			
Washington	1	1	5
Oregon	1	2	4
California	26	33	43
Territories and Possessions			
Alaska	..	..	1
Hawaii	..	..	3
Puerto Rico	1	1	5
Total	130	276	414

Lasker Awards.—The Albert and Mary Lasker Foundation announces the following winners of the Albert Lasker Medical Journalism awards for outstanding reporting on medical research and public health during 1955:

Newspapers: Mr. Selig Greenberg, staff writer, the Providence (R. I.) *Journal and Evening Bulletin*, for a series of articles in that newspaper, February, 1955, on "Hormones: Revolution in Medicine"; and Mrs. Joan Geyer, staff writer, the Provo (Utah) *Daily Herald*, for a series of articles published in that newspaper, May, 1955, on "The Secret Sickness—Mental Illness."

Magazines: Mr. Steven M. Spencer, associate editor, the *Saturday Evening Post*, for the article, "Mystery of the Blinded Babies," published in the magazine in June, 1955.

Television: "The March of Medicine," documentary film and live-action series produced by Smith, Kline & French Laboratories, Philadelphia, over the National Broadcasting Company network beginning in June, 1952.

Given for the seventh year, in cooperation with the Nieman Foundation for Journalism at Harvard University, the awards were presented at a luncheon honoring the winners, May 23, in the Ambassador Hotel, New York City. Individual winners received $1,000 each, illuminated scrolls, and silver statuettes of the Winged Victory of Samothrace, symbolizing victory over death and disease. Dr. Howard A. Rusk, associate editor, the New York *Times*, and a member of the foundation's awards jury, was chairman of the luncheon, at which the speakers included Dr. Leona Baumgartner, commissioner, New York City Department of Health, and Representative J. Percy Priest (Tenn.), chairman of the House Interstate and Foreign Commerce Committee and a former editor of the Nashville *Tennessean*.

FOREIGN

Meeting on Mental Health.—The ninth annual meeting of the World Federation of Mental Health will convene in Berlin, Germany, Aug. 12-17, to discuss "Mental Hygiene in the Parental Home, in Homes, and Schools." It is anticipated that all 44 member nations of the federation will send delegates to Berlin. The general secretary of the meeting is Esther M. Thornton, 19 Manchester St., London, W. 1., England.

Congress of Internal Medicine.—The fourth International Congress of Internal Medicine will meet in Madrid, Spain, Sept. 19-23, to consider "The Role of the Adrenals in the Pathogenesis and Evolution of Internal Diseases" and "Bronchial Asthma and Emphysema." The opening ceremony at 4 p. m. Wednesday will be followed by a documentary film, "Monumental and Artistic Spain." A symposium on the present situation of internal medicine is scheduled for 7 p. m. Among the presentations during the congress will be "The Dynamics of Adrenal Cortical Activity in Health and Disease" by Dr. Peter H. Forsham, San Francisco, "The Syndrome of Primary Aldosteronism" by Dr. Jerome W. Conn, Ann Arbor, Mich., and "Influence of Bilateral Adrenalectomy on Human Disease" by Dr. Charles B. Huggins, Chicago. The numerous social activities include a concert, a fête in the Retiro Park, the official banquet, and a visit to Toledo.

Congress of Allergology.—The third European Congress of Allergology, organized by the Italian Society of Allergology, will be held in Florence, Italy, Sept. 12-15, under the sponsorship of the International Association of Allergology. Subjects to be considered will include Genesis and Localization of Antibodies, Allergy and the Neurovegetative System, Increasing Factors of Allergic Phenomena at the Present Time, Mechanism of Delayed Reactions, Classification and Terminology in Allergy, and Standardization of Allergenic Extracts. Among the participants will be Drs. Leslie N. Gay, Baltimore (Experience with Steroids in the Treatment of Chronic Bronchial Asthma); Aaron N. Gorelik, New York City (The Relationship of Allergy to Heart Disease); and Frederick W. Wittich, Minneapolis (Modern Treatment of Chronic Asthma in Aged) and Manessch G. Sevag, Ph.D., Newtown Square, Pa. (Drug Tolerance and Allergic Phenomena). Further information may be obtained from the general secretary, Prof. Umberto Serafini, Istituto di Patologia Medica, Viale Morgagni, Florence, Italy.

Congress of Cardiology.—The second European Congress of Cardiology will convene in Concert Hall, Stockholm, Sweden, Sept. 10-14. Morning programs will include a lecture, "The Clinical Applicability of the Heart Volume Determination"; panel discussion on Organic Peripheral Artery Disease, Isolated Atrial and Ventricular Septal Defects, Acquired Aortic Stenosis, and Pulmonary Hypertension and symposiums on Etiology and Pathogenesis of Atherosclerosis, Circulation in Hypothermia, and Cardiac Output and Its Regulation. Concurrent round-table conferences in the afternoons will include Treatment of Essential Hypertension; Treatment of Paroxysmal Tachycardias and Other Ectopic Rhythms; Phonocardiography; and Indications and Hazards of Heart Catheterization and Angiocardiography. Speakers at these symposiums, panels, and round-table conferences will be specially invited. Numerous social events and excursions have been planned. On Sunday there will be an informal reception at the National Art Gallery; on Monday and Wednesday a performance at the 18th century Drottningholm Court Theatre, with buffet-dinner in the foyer; and on Tuesday a banquet in the city hall. Precongress and postcongress tours have also been scheduled.

CORRECTION

The Physician in Service.—In the letter to the editor titled "The Physician in Service" in THE JOURNAL, July 7, 1956, page 1001, the first word in the ninth line should have been "now," so that the sentence would read: "In the main, the various letters that have been published have been written by Naval Reserve medical officers now on inactive duty."

EXAMINATIONS AND LICENSURE

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY: *Oral.* St. Louis, Oct. 12-15. Final date for filing applications was April 1. Sec., Dr. B. M. Kesten, One Haven Ave., New York 32.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 15, 1956. Final date for filing application was May 1. *Oral Examinations in 1956.* New York City, Sept. 21-25. Final date for filing application was April 1. Exec. Sec., Dr. William A. Werrell, 1 West Main St., Madison 3, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Part I.* 1957. Applications for certification for the 1957 examinations are now being accepted. All candidates are urged to make such application at the earliest date possible. Deadline date for receipt of applications, new and reopened, is October 1. Dr. Robert L. Faulkner, 205 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Practical Examination.* St. Louis, Oct. 20-24. *Written.* Jan. 21, 1957. Applications must be filed before July 1, 1956. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland 9, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral. Part II.* Chicago, January 1957. Final date for filing application is Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Ave., Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Written and Oral.* Chicago, Oct. 8-11. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PATHOLOGY: *Written for Pathological Anatomy and Clinical Pathology,* Oct. 4-6. Final date for filing application is Sept. 1. Sec., Dr. Edward B. Smith, 1040-1232 W. Michigan St., Indianapolis 7.

AMERICAN BOARD OF PEDIATRICS: *Oral, Part II.* New York City, Oct. 12-14, and San Francisco, Dec. 7-9. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PLASTIC SURGERY: Miami, Oct. 17-19. Corres. Sec., Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

AMERICAN BOARD OF PREVENTIVE MEDICINE: *Oral and Written. Public Health.* Philadephia, Nov. 8-10. Sec., Dr. Ernest L. Stebbins, 615 N. Wolfe St., Baltimore, Md.

AMERICAN BOARD OF PROCTOLOGY: *Oral and Written.* Philadephia, Sept. 29. Final date for filing application was June 28. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, Dec. 10-11 and New Orleans, Mar. 18-19. Sec., Dr. David A. Boyd, Jr., 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: Los Angeles, Sept. 30-Oct. 4. Final date for filing application was June 1. Sec., Dr. B. R. Kirklin, Kahler Hotel Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part I.* Various Centers Throughout the United States and in Certain Military Centers Abroad, Oct. 31. *Part II.* Buffalo, Sept. 24-25; Rochester, Minn., Oct. 15-16; New Haven, Nov. 19-20; Kansas City, Kan., Dec. 10-11; Los Angeles, Jan. 14-15; San Francisco, Jan. 17-18; Houston, Feb. 18-19; Nashville, Mar. 11-12; Boston, April 8-9, and New York, June 10-11.

AMERICAN BOARD OF UROLOGY: February 1957. Sec., Dr. William Niles Wishard, 1711 N. Capitol Ave., Indianapolis 7.

BOARD OF THORACIC SURGERY: *Written.* Various centers throughout the country, September. Final date for filing applications is July 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

GOVERNMENT SERVICES

ARMY

Colonel Bennett Retired.—Col. Eaton W. Bennett, chief, department of neuropsychiatry, Brooke Army Hospital, who retired in July after 33 years of military service, has joined the staff of the state hospital in San Antonio, Texas, as a senior physician. He is a diplomate of the American Board of Psychiatry. During World War II, Colonel Bennett served in the Far East with the 10th Army, as commanding officer of two general hospitals and as surgeon of the Philippine Base Command.

Personal.—Dr. Stanhope Bayne-Jones, technical director of research for the Army Surgeon General's Office, Washington, D. C., received an honorary doctor of laws degree at Tulane University, New Orleans, May 28, when he delivered the graduation address, speaking on "The Liberal Sciences."

NAVY

Middle East Medical Assembly at Beirut.—Capt. Elmer R. King, chief of the x-ray department at the Naval Hospital in Bethesda, Md., presented a paper at the sixth Middle East Medical Assembly in Beirut, Lebanon, April 6-8, on "Present Status of Radio Iodine in Thyroid Disease." Capt. Donald W. Miller, chief, surgical service, Naval Hospital, Newport, R. I., also attended the assembly, as did the following officers who are attached to the U. S. Naval Medical Research Unit, no. 3, Cairo, Egypt: Commander Stanley W. Hanford, head, department of physiology; Lieut. Commander William C. E. Pfischner, department of clinical investigations; Lieut. Edgar M. Neptune Jr., department of clinical investigations; and Lieut. Charles D. McGuire, head, department of bacteriology.

Medical Meeting in Cuba.—Members of the Cuban Medical Society and medical officers of the Cuban Navy in April attended two series of lectures given by Lieut. Walter R. Kirker, M.C., U.S.N.R. The first series was given at Camagüey and the second at the Curie Hospital in Havana. These lectures and a movie shown pertained to the medical aspects of diving. Lieutenant Kirker is on duty at the Naval School, Underwater Swimmers, U. S. Naval Station, Key West, Fla.

Personal.—Rear Adm. Bartholomew W. Hogan, the surgeon general, was the guest speaker at an alumni dinner on June 13, at the Stritch School of Medicine, Loyola University, Chicago. On July 14, Admiral Hogan was in Lima, Peru, attending the opening ceremonies of the new Peruvian Medical Center, which is located between Lima and Callal and is modeled after the U. S. Naval Hospital at Beaufort, S. C.

New Navy Hospital at Portsmouth.—A new 800-bed U. S. Naval Hospital is to be built at Portsmouth, Va., at a cost of about 13 million dollars. At the ground-breaking ceremony, June 20, Rear Adm. French R. Moore, M.C., assistant chief for planning and logistics, represented the Bureau of Medicine and Surgery.

VETERANS ADMINISTRATION

Treatment of Mental Patients.—Discharges of former chronically ill mental patients, now treated with tranquilizing drugs, increased 36% at the Northampton (Mass.) Veterans Administration Hospital, according to a recently released survey. In the last six months of 1954, when few patients were treated with tranquilizing drugs (chlorpromazine and reserpine), the hospital reported 86 patients discharged compared to 118 in the same period in 1953, when extensive drug treatment was given.

Among patients hospitalized five years or longer, it was found that the percentage of improved cases increased even more when these patients were treated by drugs as compared to other types of treatment. Thirty-three were discharged among this group as compared to 19 the year before without benefit of drugs, or a 77% increase. In those hospitalized less than five years, 85 were discharged against 66, or a 69% increase.

Of 533 patients receiving different types of psychiatric treatment, 202 were treated with tranquilizing drugs, and of this latter group 76% showed improvement. The percentage of improvement in those treated with the tranquilizing drugs was considerably higher than among those given other types of psychiatric treatment. Many of those successfully treated with drugs had failed to improve under other types of treatment. The other forms of psychiatric treatment studied were found effective to the following degrees: insulin, 59%; electric shock, 54%; and lobotomy, 46%. The group surveyed ranged in age from 18 to 69 years and had been hospitalized for periods of from one month to 30 years.

Protection Against Fire in Hospitals.—The Veterans Administration has released a progress report on its program of providing protection against fire for sick and disabled veterans in VA hospitals. VA has equipped in recent years or is equipping hundreds of buildings in its older hospital plants with such protective features as automatic sprinkler systems, stair well enclosures, fire escapes, fire doors, smoke barriers, and fire alarm systems. By June 30, 1956, VA will have completed construction on 35 or more major protection projects, with an estimated construction cost of nearly 2 million dollars. Construction is under way on 53 other projects.

About 31,000 beds have been provided in the 61 new VA hospitals placed in operation since the end of World War II. In addition to increasing the bed capacity, the erection of these modern, fire-resistive hospitals has enabled the agency to abandon 14 older, non-fire-resistive hospitals. Construction additions at 38 other stations have added nearly 14,000 more beds in fire-resistive buildings, many of which replaced older units.

At the present VA is constructing a fire-resistive 1,000-bed replacement hospital at Topeka, Kan., and, subject to approval of budget programs, has plans for the replacement with fire-resistive construction of 10 hospitals and the extensive modernization of the older hospitals in the system.

Personal.—Dr. George M. Lyon, formerly of the Department of Medicine and Surgery, Washington, D. C., became manager of the Huntington, W. Va., VA Hospital April 1, succeeding Dr. Haughton W. Baxley, who is being reassigned to professional duties with the Department of Medicine and Surgery.

PUBLIC HEALTH SERVICE

Courses on Venereal Disease.—The U. S. Public Health Service announces that laboratory refresher courses on the serology of syphilis, management and control of syphilis serology by the regional laboratory, and tests for syphilis using Treponema pallidum will be offered at the Venereal Disease Research Laboratory in Chamblee, Ga., from August, 1956, to May, 1957: Serology of Syphilis (Aug. 20-31; Sept. 17-28; Dec. 3-14; Feb. 4-15; and March 18-29); Management and Control of Syphilis Serology by the Regional Laboratory (Oct. 8-19; April 22-May 3); and Tests for Syphilis Using the Treponema Pallidum (Oct. 22-Nov. 2; April 8-19). The courses in serology of syphilis are designed to provide refresher training to senior operating personnel of state and public health service laboratories and to other qualified individuals from the United States and other countries. Applicants for the courses in tests for syphilis using the Treponema pallidum should have had adequate experience in the field of serology and should be in supervisory positions. The course in management and control of syphilis serology by the regional laboratory is designed for assistant laboratory directors and senior laboratory staff members. Applications for any of the courses must be signed by the state health office or state laboratory director unless the applicant is an employee of the Public Health Service. In such instances, application must be approved by the medical officer-in-charge. Application blanks may be obtained from the director, Venereal Disease Research Laboratory, Division of Special Health Services, Public Health Service, Department of Health, Education, and Welfare, P. O. Box 185, Chamblee, Ga.

DEATHS

Watkins, William Warner ✠ Phoenix, Ariz.; born in Keysville, Va., Oct. 30, 1883; Medical College of Virginia, Richmond, 1906; secretary in 1912-1913, and again in 1941-1943, of the Arizona State Medical Association, of which he was president in 1918-1919; helped reorganize the Maricopa County Medical Society, serving at various times as its president, secretary, and librarian; member of the House of Delegates of the American Medical Association in 1924; in 1914 became a charter member of the Medical and Surgical Association of the Southwest, an organization that later became the Southwestern Medical Association, serving as vice-president in 1919, as president in 1920, and as secretary from 1924 to 1935; in 1912 aided in the organization of the Arizona Association for the Study and Prevention of Tuberculosis, now known as the Arizona State Tuberculosis and Health Association, serving as its president in 1914 and its treasurer for some 25 years; life member of the American College of Physicians and served as its governor for Arizona for 10 years; member of the American Association for the Advancement of Science and of the American Roentgen Ray Society and from 1921 to 1923 served that organization as its secretary and member of the council; member of the Radiological Society of North America and for two terms vice-president; one of the charter members of the American College of Radiology, and a member of its first board of chancellors; member of the American Trudeau Society; specialist certified by the American Board of Radiology; associated with St. Luke's, St. Joseph, and Good Samaritan hospitals; for many years served on the board of directors of the Y. M. C. A., and for two years served as its president; from 1912 to 1916 editor of the *Arizona Medical Journal*, which in 1922 merged with *Southwestern Medicine*, became editor-in-chief of the combined journal, a position he held until 1935; at one time was on the editorial board of *Radiology;* died April 10, aged 72, of carcinoma of the sigmoid.

Nash, Philip Ingram, Brooklyn, N. Y.; born July 16, 1875; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1902; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; member of the Industrial Medical Association; an associate member of the American Medical Association; clinical professor emeritus of medicine, State University of New York College of Medicine, formerly known as the Long Island College of Medicine; past-president of the Kings County Medical Society; first president of the Coney Island Chamber of Commerce; from 1934 to 1951 medical assistant district attorney for Kings County; consulting physician, St. Francis Hospital in Poughkeepsie, N. Y.; served as chairman of the medical board of the Harbor Hospital and the Coney Island Hospital, where he was associated for many years, and where he died April 25, aged 80, of arteriosclerotic heart disease.

Condit, William Henry ✠ Minneapolis; born in 1872; University of Minnesota College of Medicine and Surgery, Minneapolis, 1899; specialist certified by the American Board of Obstetrics and Gynecology; formerly on the faculty of his alma mater; served as councilor, first vice-president, and for many years treasurer of the Minnesota State Medical Association, which in 1952 presented him with the distinguished service award for "his immeasurable contribution and individual mark of proud achievement in Minnesota's medical progress"; on the staffs of Northwestern and University of Minnesota hospitals, and the Doctors Memorial Hospital, where he died April 21, aged 83, of coronary thrombosis.

Hughes, William Franklin ✠ Indianapolis; born Aug. 11, 1871; Medical College of Indiana, Indianapolis, 1902; professor emeritus of ophthalmology at the Indiana University School of Medicine; specialist certified by the American Board of Ophthalmology; past-president of the Indiana Academy of Ophthalmology and Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the International College of Surgeons and the American College of Surgeons; before his retirement was on the staffs of the Indianapolis General, Methodist, and St. Vincent's hospitals and of the Indiana University Medical Center; died April 19, aged 84, of cerebral hemorrhage.

Fuiks, Dellivan Meldrim ✠ Sacramento, Calif.; born in Iowa City, Iowa, Jan. 10, 1904; State University of Iowa College of Medicine, Iowa City, 1927; specialist certified by the American Board of Orthopaedic Surgery; member of the Industrial Medical Association; veteran of World War II; orthopedic surgeon for the crippled children's services, state department of public health; served as president of the Sacramento Crippled Children's Society; chief of staff, Sacramento County Hospital; member of the staffs of Sutter and Mercy hospitals; at one time on the faculty of his alma mater; died April 17, aged 52, of carcinoma of the rectum.

Starr, Louis ✠ Brooklyn, N. Y.; L. R. C. P., Edinburgh, L. R. C. S., Edinburgh, and L. F. P. & S., Glasgow, 1939; certified by the National Board of Medical Examiners; specialist certified by the American Board of Orthopaedic Surgery; member of the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; clinical instructor, orthopedic surgery, State University of New York College of Medicine; on the staffs of the Long Island College Hospital, Kings County Hospital, St. John's Episcopal Hospital, and the Maimonides Hospital; died April 21, aged 43, of myocardial infarction.

Dunn, James Manning, East Hampton, N. Y.; Albany (N. Y.) Medical College, 1915; specialist certified by the American Board of Otolaryngology; veteran of World Wars I and II; past-president of the Schenectady County Medical Society; member of the Medical Society of the State of New York; retired from the Veterans Administration July 31, 1952; served on the staffs of the Manhattan Eye, Ear and Throat Hospital in New York City and the Ellis Hospital in Schenectady; died in the Veterans Administration Hospital, Albany, April 10, aged 68.

Adams, Charles Joseph ✠ Kokomo, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; veteran of World War I; on the staff of St. Joseph Memorial Hospital; died April 7, aged 73, of cerebral hemorrhage.

Agnew, Fred F. ✠ Independence, Iowa; Jefferson Medical College of Philadelphia, 1902; fellow of the American College of Surgeons; veteran of World War I; for many years associated with the Peoples Hospital; died April 18, aged 82, of bronchopneumonia.

Alexander, Harry Allison ✠ Boulder, Colo.; Indiana University School of Medicine, Indianapolis, 1926; fellow of the American College of Physicians; on the staffs of the Community Hospital and the Boulder-Colorado Sanitarium and Hospital; veteran of World War II; died April 15, aged 56, of coronary thrombosis.

Allenburger, Christian Alexander ✠ Columbus, Neb.; Rush Medical College, Chicago, 1895; also a graduate in pharmacy; past-president of the Platte County Medical Society; fellow of the American College of Surgeons; associated with St. Mary Hospital, where for 25 years he was chief of the medical staff; died April 26, aged 85, of cerebral hemorrhage and pneumonia.

Amidon, Charles Stacey ✠ Harlingen, Texas; Eclectic Medical Institute, Cincinnati, 1902; formerly on the faculty of his alma mater; practiced in Cincinnati, where he was for many years on the staff of the Bethesda Hospital, serving as vice-president of the staff; died April 15, aged 77, of coronary thrombosis.

✠ Indicates Member of the American Medical Association.

Angell, David Morrison ✙ Cochituate, Mass.; College of Physicians and Surgeons, Boston, 1922; Middlesex College of Medicine and Surgery, Cambridge, 1924; died March 7, aged 75, of cancer.

Aron, Edward, Chicago; University of Illinois College of Medicine, Chicago, 1933; on the staff of the Manor Hospital; a staff member of the Mount Sinai Hospital, where he interned and where he died April 30, aged 50, of acute pulmonary edema and arteriosclerosis.

Ashbaugh, Guy A., Riverton, Wyo.; Denver and Gross College of Medicine, Denver, 1907; member of the Colorado State Medical Society; an associate member of the American Medical Association; died in Lakewood, Colo., April 19, aged 74, of coronary occlusion and intrapulmonary hemorrhage as the result of an automobile accident.

Gaston, Mary E., Somerville, N. J.; Woman's Medical College of Pennsylvania, Philadelphia, 1888; on the staff of the Somerset Hospital; died April 19, aged 100, of hypostatic pneumonia.

Gillis, Floyd Daniels ✙ Mitchell, S. D.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1912; fellow of the American College of Surgeons; since May, 1955, president of the South Dakota State Medical Association; on the staffs of the St. Joseph's and Methodist State hospitals; died May 30, aged 67, of a heart attack.

Glasgow, William Adams ✙ Seattle; Dunham Medical College, Chicago, 1901; one of the founders of Maynard Hospital and president of the board of trustees since its inception; died in the Maynard Hospital May 15, aged 77, of gastrointestinal hemorrhage after a cholecystectomy.

Glenn, Milton Lourie, Ridley Park, Pa.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899; on the staff of the Taylor Hospital; died April 16, aged 87, of a heart attack.

Glover, Mary Elizabeth ✙ San Francisco; Hahnemann Medical College of the Pacific, San Francisco, 1905; at one time on the faculty of her alma mater; on the staff of the Children's Hospital, where she died May 20, aged 75, of injuries received in a fall.

Gold, James Douglas ✙ Bridgeport, Conn.; College of Physicians and Surgeons, medical department of Columbia College, New York City, 1891; past-president of the Connecticut State Medical Association, Fairfield County Medical Society, and the Bridgeport Medical Society; veteran of World War I; on the staffs of the Greenwich (Conn.) Hospital, St. Vincent's Hospital, and the Bridgeport Hospital, where he died April 14, aged 89, of myocardial infarction and coronary occlusion.

Green, James ✙ Los Angeles; Gross Medical College, Denver, 1895; died in the French Hospital April 2, aged 82, of myocardial infarction and coronary thrombosis.

Greer, Martin Grant N., St. Petersburg, Fla.; Western Pennsylvania Medical College, Pittsburgh, 1900; for many years practiced in Pittsburgh; died April 25, aged 82.

Gruenwald, Siegfried ✙ Alton, Ill.; Medizinische Fakultät der Universität, Vienna, Austria, 1920; member of the American Psychiatric Association; assistant superintendent of the Alton State Hospital; formerly clinical director of the Independence (Iowa) State Hospital; died in Merion, Pa., May 6, aged 64, of cancer.

Hambley, Thomas J., Ironwood, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; died in the Grand View Hospital April 23, aged 92.

Hanna, John James ✙ Glen Rose, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1899; member of the American Academy of General Practice; past-president of the Johnson County Medical Society and the Panhandle District Medical Society; died May 3, aged 80, of cerebral thrombosis.

Harper, Lamar Blewett ✙ Lieut. Commander, U. S. Navy, retired, Yuma, Ariz.; George Washington University School of Medicine, Washington, D. C., 1936; certified by the National Board of Medical Examiners; specialist certified by the American Board of Ophthalmology; member of the California Medical Association; entered the U. S. Navy in 1938 and retired Jan. 1, 1946; died May 2, aged 43.

Harris, Lester J. ✙ Jackson, Mich.; Ohio Medical University, Columbus, 1896; served as president and treasurer of the Jackson County Medical Society; from 1938 to 1952 president of the Security Savings and Loan Association and since 1952 chairman of the board; on the staff of the W. A. Foote Memorial Hospital, where he died April 26, aged 84, of myocardial infarction.

Hartley, Everett Charles ✙ St. Paul; University of Minnesota Medical School, Minneapolis, 1918; clinical assistant professor of obstetrics and gynecology at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology; member of the Central Association of Obstetricians and Gynecologists; served in France during World War I; on the staff of the Bethesda and St. Joseph's hospitals and the Charles T. Miller Hospital, where he died May 1, aged 63, of ruptured aneurysm of the splenic artery.

Hasbrouck, Edwin Marble, Washington, D. C.; Georgetown University School of Medicine, Washington, 1895; died May 25, aged 90.

Haumeder, Hans ✙ Oakland, Calif.; Medizinische Fakultät der Universität, Vienna, Austria, 1914; specialist certified by the American Board of Internal Medicine; served on the staffs of St. Joseph's Hospital in New Hampton, Iowa, the Herrick Memorial Hospital in Berkeley, and the Permanente Foundation Hospital; died April 27, aged 65, of acute myocardial infarction.

Hawley, Darrell Bertrand ✙ Los Angeles; University of California School of Medicine, San Francisco, 1934; member of the American Society of Anesthesiologists; on the staff of Queen of the Angels Hospital; died May 4, aged 66, of cancer of the gastrointestinal tract.

Haworth, Morris Wells, Sacramento, Calif.; Barnes Medical College, St. Louis, 1901; an associate member of the American Medical Association; died in the Mercy Hospital May 3, aged 80, of aneurysm of the abdominal aorta.

Herman, Harold ✙ New York City; Columbia University College of Physicians and Surgeons, New York City, 1917; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; died April 13, aged 60, of bronchopneumonia.

Herrick, Van Buren ✙ Worcester, Mass.; University of Vermont College of Medicine, Burlington, 1896; died in the Worcester City Hospital April 15, aged 85.

Hoffman, William, Lynn, Mass.; Middlesex University School of Medicine, Waltham, 1942; member of the Massachusetts Medical Society and the American Academy of General Practice; on the staff of the Union Hospital; died in the Beth Israel Hospital, Boston, April 30, aged 38.

Honig, Leopold, New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1913; died in Vienna, Austria, March 6, aged 69.

Howard, Byron Lorenzo, Detroit; Detroit College of Medicine and Surgery, 1919; on the staffs of the Providence Hospital and the Detroit Memorial Hospital, where he died April 10, aged 60, of coronary thrombosis.

Hower, Heister Vanderslice, Berwick, Pa.; College of Physicians and Surgeons, Baltimore, 1887; past-president of the Columbia County Medical Society; an associate member of the American Medical Association; veteran of World War I; on the staff of the Berwick Hospital; died April 16, aged 92.

Hundley, Preston Garnett ✙ Lynchburg, Va.; University of Maryland School of Medicine, Baltimore, 1909; also a graduate in pharmacy; served on the staffs of the Guggenheimer Memorial and Lynchburg General hospitals; died April 28, aged 76, of leukemia.

FOREIGN LETTERS

AUSTRIA

Ulcer-Carcinoma.—At the meeting of the Society of Physicians in Vienna on May 4, Dr. G. H. Marcus stated that an estimation of the frequency of malignant degeneration in gastric ulcers cannot be made easily because of certain difficulties in terminology. Between 1953 and 1955 he observed 48 such cases among 368 patients with carcinoma of the stomach and 221 patients with originally benign gastric ulcers. Twenty-five of these were confirmed by microscopic examination, and in the other 23 the presence of an ulcer-carcinoma was highly probable according to the clinical and roentgenological findings. The ulcer-carcinomas thus accounted for 7 to 13% of the carcinomas of the stomach. The rate for probability of malignant degeneration of benign gastric ulcers is between 9 and 17%. The diagnosis of the initial malignancy is difficult, if not impossible. Differentiation between benign ulcers and initial carcinomas is sometimes impossible even with the aid of clinical and laboratory studies, gastroscopy, and roentgenograms. Surgical treatment of gastric ulcers is, therefore, recommended, particularly for patients with a familial history of cancer and for patients of the age at which cancer may be suspected, provided that internal treatment for several weeks does not result in a complete and indisputable cure.

Gastric Carcinoma Following Operation.—At the same meeting Dr. P. Huber said that the development of gastric carcinoma following operation is not so rare as had been assumed. This is not surprising if one considers the high incidence of carcinoma of the stomach and the large number of patients operated on for ulcers every year. These carcinomas are frequently not diagnosed until too late for lifesaving measures to be applied. There is also the question whether the coincidence is incidental or whether there may be a cause-and-effect relationship in some patients. Such a relationship could be considered (1) in cases of primary erroneous diagnosis, when the original ulcer was not benign but carcinomatous; (2) in cases of carcinomatous degeneration of recurrent ulcers or anastomotic ulcers after operation for gastric ulcer; and (3) when the gastrectomy creates conditions that predispose to the development of carcinoma. The last possibility is entirely theoretical. Early diagnosis and thereby improved results of treatment could be obtained if it is realized that any ulcer crater revealed in a roentgenogram may represent a carcinoma. Close cooperation between internist and surgeon concerning indications may be helpful, and, finally, the attention of patients operated on for gastric ulcer should be directed to the fact that persistent symptoms after resection are not normal and must have definite causes, which must be carefully sought.

Surgical Treatment of Postoperative Peptic Ulcer.—At the same meeting, Dr. R. Oppolzer said that, with regard to the incidence of postgastrectomy (Billroth 2) peptic ulcer, American and European statistics show a difference varying from 0.5% to 8%. Postoperative peptic ulcer may occur in as high as 96% of patients after resection of a duodenal ulcer. After gastroenterostomy for duodenal ulcer the incidence varies from 4 to 30%; after exclusion gastrectomy the rate varies from 6 to 23%; and after pylorectomy (Billroth 1) from 0.9 to 3.5%. Radical resection was associated with a high mortality rate. Vagotomy today is a routine procedure in patients with postoperative peptic ulcer. Highly satisfactory results are obtained and operative mortality is low, but only in patients with postoperative peptic ulcer after resection. After gastroenterostomy, major resection should be performed with anastomosis according to Billroth 2.

Surgical Treatment of Peptic Ulcer.—At the same meeting, Dr. G. Salzer reported that, in a series of 2,488 patients with peptic ulcers who were operated on in the last 23 years, 86% were followed up. Conclusive evaluation of the prognosis of surgical treatment of patients with peptic ulcers can be made, since in the period considered the indications for operation of uncomplicated ulcer have remained unchanged. The recent, untreated ulcer should be treated medically, and only ulcers that are refractory to such treatment and repeatedly recurring ulcers provide indications for surgical treatment. Follow-up results were classified into four groups: (1) complete freedom from symptoms; (2) temporary minor symptoms but full ability to work; (3) more frequent and more severe complaints with notable reduction of capacity to work; and (4) severe complaints associated with permanent disability. Follow-up examinations showed that 88% of the patients who underwent resection belong to group 1; 9% to group 2; 2.7% to group 3; and 0.3% to group 4. Thus, only 3% were not fully employed. Follow-up examinations showed that the primary mortality as well as the postoperative complaints was increasing in those who had the disease more than five years. After this time, healing may no longer be expected from conservative treatment. The speaker advised operation for patients with an uncomplicated ulcer of five or six years' duration in whom there are repeated recurrences. This should prevent massive hemorrhage and perforation—complications associated with a high mortality.

BRAZIL

Q Fever.—The results of investigation concerning Q fever in cattle ranchers, dairy workers, and cattle of the state of São Paulo are reported by Dr. Luiz Augusto Ribeiro do Valle and his coworkers in *Arquivos da Faculdade de higiene e saúde pública da Universidade de São Paulo.* They found that (1) the specific complement-fixation tests in 65 of 71 cattle ranchers or dairy workers were negative, one was anticomplementary, and 5 were positive (2 at a titer of 1:8 and 3 at a titer of 1:16); (2) a second test of 20 of the dairy workers showed no significant difference from the first examination when performed 45 days later; a similar result was obtained in the study of 2 ranchmen when examined a second time after an interval of about nine months; (3) serum from 171 cows was negative in 131, anticomplementary in 16, and positive in 24 (16 at a titer of 1:16, 5 at a titer of 1:32, 2 at a titer of 1:64, and one at a titer of 1:256); (4) two heifers that had positive complement fixation at titers of 1:32 and 1:64 showed a drop in titer about two months later, to 1:4 and 1:32 respectively, while the tests performed with serum from 12 other animals of the same herd, negative in the first test, did not show significantly different results five months later; (5) attempts to isolate Coxiella burnetti from two samples of blood, one of milk, and one of placenta from cows of two herds failed; and (6) of 26 serums from cows recently imported from the Netherlands and Great Britain, 18 were negative, 2 anticomplementary, and 6 positive (5 at a titer of 1:16 and one at a titer of 1:32).

Cardiac Surgery.—A new method for the bypass of the right side of the heart and left ventricle and total bypass of the heart was devised by Dr. Hugo J. Felipozzi and his co-workers, who

The items in these letters are contributed by regular correspondents in the various foreign countries.

used a Sigma motor pumping apparatus and utilized the patient's lungs as oxygenator of the blood. They presented a paper before the Associação Paulista de Medicina, reporting two cases in which this method was used. The bypass of the right side of the heart was accomplished by pumping the blood from both venae cavae into one of the branches of the left pulmonary artery. By using this technique it was possible to operate on the pulmonary valve and the right ventricular cavity under direct vision. This technique was applied without difficulties even in the presence of auricular septal defects experimentally created. After exhaustive and encouraging experiments with animals, including simultaneous graphic recording of the pressure changes in the pulmonary artery and left auricle and the systemic pressure, it was decided to use this method in patients. Two patients with pulmonary stenosis were operated on, and the pulmonary valves were easily cut under direct vision.

The bypass of the right side of the heart and the left ventricle was done using two circuits; the first as described for bypassing the right side and the second from the left auricle to the right subclavian artery. This technique makes possible the correction of ventricular septal defects as a single malformation or in association with other defects. The total bypass of the heart was possible with the use of only one lung as oxygenator. As for the other cases, the blood from the venae cavae was pumped into the left pulmonary artery, while the arterialized blood from the left lung was collected from the left pulmonary veins and pumped into the right subclavian artery. This makes it possible to operate on the mitral valve and the auricular septum under direct vision. In all circumstances the output of the apparatus was calculated according to the azygos flow principle. Despite the small output used for the bypass of the right side of the heart, the systemic blood pressure remained at about normal levels. The feasibility and safety of this method were due chiefly to (1) the use of the patient's lung to oxygenate the blood; (2) the application of the azygos flow principle, which permits the use of a small output; and (3) selection of one or two extracorporeal circuits according to the defect to be repaired.

COLOMBIA

Thyroid Function Tests.—Dr. A. Ucrós Cuéllar has made clinical observations and laboratory tests on 128 patients, 48 of whom had hypothyroidism, 71 euthyroidism, and 9 hyperthyroidism. Eighty-five patients had nodular or diffuse goiter. Tests with radioactive iodine were not made. In the group of patients with hypothyroidism, the level of protein-bound iodine in the blood was normal in 59%, low in 32%, and high in 9%. The basal metabolic rate was normal in 70%, low in 26.5%, and high in 3.5%. The amount of cholesterol in the blood was normal in 51.5%, low in 15.5%, and high in 33%. In the group of patients with euthyroidism, protein-bound iodine values were normal in 82%, low in 11.5%, and high in 6.5%. The basal metabolic rate was normal in 79%, high in 16%, and low in 5%. Blood cholesterol was normal in 89.8%. In the group of patients with hyperthyroidism, the levels of protein-bound iodine were normal in 43% and high in 57%. The basal metabolic rate was normal in 33% and high in 67%. Blood cholesterol was normal in 75% and high in 25%. The author concludes that the basal metabolic rate when determined in ideal conditions is still a very good method for determining thyroid function. The errors in statistics are due to faulty laboratory technique. The technique for determination of levels of protein-bound iodine is difficult. The procedure has as many sources of error as that for the basal metabolic rate. Both procedures have about the same diagnostic value. Cholesterol determination is of little diagnostic value.

Thyrotoxic Crises.—Dr. J. Cortazar, the president of the Sociedad Colombiana de Endocrinología and director of the Instituto Nacional de Cancerología, reported three cases of postoperative thyrotoxicosis. The preoperative routine medication consisted of use of cortisone, chlorpromazine, phenobarbital, and adrenal cortex extract (Eschatin). Cortisone acetate was given from the day prior to operation till the fourth postoperative day in doses of 25 mg. three times daily. Chlorpromazine was given four or five times a day in doses of 25 mg. and phenobarbital four times a day in doses of 100 mg. for five days preceding the operation. Eschatin was given intravenously in doses of 30 cc. One injection was given on the day before the operation and another on the day of the operation. The author concluded that (1) thyrotoxic crises are the expression of a general adaptation syndrome due to exhaustion of resistance caused by stress; (2) the administration of corticosteroids in association with other drugs affecting the central nervous system may cause diminution of the oxygen consumption and prevent the occurrence of symptoms; and (3) any operation on a patient with thyrotoxicosis is justified only if it is considered lifesaving. Operation on the thyroid in patients with hyperthyroidism is indicated only after failure of all other methods of treatment, especially after failure of treatment with radioactive iodine.

FRANCE

Atypical Tuberculosis.—A. Jacquelin and his co-workers present two articles on atypical tuberculosis in *La Semaine des hôpiteux de Paris* (32:1253, 1956). In the first the authors stated that patients with such atypical forms of tuberculosis as chronic febrile bacillary states of Burnand's type, Poncet's rheumatism, iridocyclitis, asthma, enterocolitis, and even psychosis are susceptible to "second" infections, possibly frequent, protracted, and recurrent due either to pyogenic agents, Escherichia coli, micrococci, pneumococci, streptococci, Hemophilus influenzae, or to viruses. The connection between the tuberculous impregnation and such secondary infections can be recognized in some patients by the reappearance or flare-up of an infection, particularly from micrococci, E. coli, or virus; by the effect of the tuberculin test; or in the course of tuberculin therapy in which too rapidly increased doses were given. The authors' observations suggest the possible curative effect of fixation abscess, various procedures for pyretotherapy, and cautery on such syndromes.

In the second article the authors state that atypical tuberculosis, streptococcic rheumatic disease, and brucellosis are characterized, after an initial septicemic phase, by a persistence of localized infective foci from which new bacteremic disseminations may arise but which above all create an allergic or even occasionally hyperallergic status responsible for distant manifestations that reveal the deeply hidden and often unrecognized infection. The purely allergic pathogenesis of these manifestations may explain their simple inflammatory characters, the nonspecifity and nonvirulence of their lesions, and the great difficulty of ascribing to them their true origin and the impossibility of obtaining formal, direct, bacteriological evidence. The proof, however, may be indirectly deduced through skin reactions to endoproteins or bacterial exotoxins, focal or syndromic reactions, and the unquestionable effectiveness of therapeutic desensitization.

Treatment of Chronic Rheumatism.—Layani and his coworkers (*Semaine hôp. Paris* 32:1299, 1956) give critical analysis on the value of cortisone in the long-term treatment of progressive chronic polyarthritis. They studied the therapeutic effect of cortisone, hydrocortisone, and prednisone and concluded that

corticotherapy should be reserved for those patients who do not respond to routine treatment and chrysotherapy. It, however, appears that prednisone, when given in small doses and possibly alternated with salicylate derivatives, constitutes an unquestionable advance.

PERU

Diagnosis of Uterine Cancer.—In the first issue of *Ginecologia y obstetricia* (1:58 [no. 1] 1955), the new official quarterly bulletin of the Peruvian Society of Obstetrics and Gynecology, Dr. Roberto Cordillo Delboy stated that Papanicolaou's method is very helpful in diagnosing uterine cancer when used routinely in unhospitalized patients suffering from diverse gynecologic conditions. By using this method the author reached a correct diagnosis in 95.4% of 482 patients. In this series 50 women were found by means of biopsy to have cancer, while the cytological study detected cancer in 40. The 10 false negative results plus 12 that were falsely positive gave a figure of 4.6% erroneous diagnoses. Since false positive results are usually due to faulty interpretation of the cellular findings, it is likely that with further experience they will be greatly reduced. As to the false negative results, which are more hazardous, they seem to be related to the complex mechanism of cellular exfoliation and only a few of them can be explained by gross deficiencies in technique. The doubtful cases should be checked periodically by studying vaginal smears and biopsy specimens. The cytological method is of doubtful value, however, in determining the grade of malignancy.

Cervical Carcinoma and Pregnancy.—In the same journal (1:29 [no. 1] 1955), Drs. Samuel Seyhet and J. Campos stated that every diagnosis of intraepithelial carcinoma made during gestation is uncertain and it should be fully verified after delivery before any treatment is recommended. They performed multiple biopsies of the uterine cervix on a series of 200 women during and shortly after delivery, and, in order to determine whether the changes found were permanent or only associated with the pregnancy, new biopsy specimens were taken 6 and 12 months after delivery in the 50 women in this series who showed histological changes on the first examination. In 10 women histological changes quite consistent with carcinoma in situ were found, and in 4 the findings also suggested the infiltration of the corium. In 18 women, atypical nuclei were seen; in 20, changes in the cellular stratification and nuclear hyperpigmentation were observed; and, in 29, an increase in the number and size of the nuclei in both the endocervix and the ectocervix was noted. Since the permanence of these changes could not be verified by later biopsies, the authors concluded that histological changes seen in the uterine cervix of pregnant women should be regarded as transitory and not malignant. Their development seems to arise regardless of the age of the patient or the number of previous pregnancies. Other findings observed in the initial biopsy specimens were: hypertrophy of the squamous epithelium in 61 women; squamous metaplasia of the endocervix in 43; hyperplasia of the basal layer in 86; decidual changes of the stroma in 21; and edema plus congestion in 120. In most patients these lesions were found to have disappeared or at least diminished in later biopsy specimens, but changes consistent with chronic cervicitis persisted.

Institute for Research on Tuberculosis.—An institute for research on tuberculosis and other pulmonary diseases was established on May 5, at the Hospital-Sanatorio Bravo Chico for tuberculous patients by the School of Medicine of the National University of San Marcos of Lima. It will be under the direction of Dr. Ovidio Garcia Rosell. A special two-story building has been built for it, and its technical equipment will be in charge of some American scientific foundations. In addition to research, the institute will cooperate with the school of medicine in teaching medical students.

Dr. Harry Bakwin Honored.—Dr. Harry Bakwin, president of the American Academy of Pediatrics, on his visit in Peru, was named honorary fellow of the Peruvian Society of Pediatrics. An address of welcome was delivered by Dr. Pompeyo Gallardo, president of the society, and the introduction speech was given by Dr. C. F. Kromdieck, president of chapter 9 of the American Academy of Pediatrics.

Endometrial Hyperplasia and Carcinoma.—Endometrial hyperplasia, as caused by a long-standing and unopposed excess of estrogen, plays an important role in causing endometrial carcinoma according to Dr. Juan Wood and his co-workers in *Ginecologia y obstetricia* (1:1 [no. 2] 1955). They reviewed 695 reports of endometrial hyperplasia proved by means of biopsy specimens and 174 reports of endometrial carcinoma, and they found that, while the hyperplasia-carcinoma ratio was 17.7:1 in women under 50 years of age, it was 2:1 in women over this age. On the other hand, they analyzed 26 reports of patients in whom malignant lesions were found associated with endometrial hyperplasia and showed this association to be 8.5 times as frequent after the onset of the menopause as before it. In view of the fact that the incidence of cancer is four times as great after the menopause as before it, the ratio for such an association is reduced to 4.5:1. In studying the age of the patients when the diagnosis of malignancy was made, it was shown that, in the group of patients showing both adenomatous hyperplasia and adenocarcinoma, the average age was 48, whereas the average age in patients with adenocystic hyperplasia plus adenocarcinoma was 58.

In the group of patients with adenocarcinoma associated with both types of hyperplasia, the average age was 52. The authors believe that their findings indicate that malignant degeneration occurs more frequently and earlier when adenomatous hyperplasia preexists. They therefore advise hysterectomy as a prophylactic measure whenever endometrial hyperplasia is found in the postmenopausal period. Treatment with x-rays or radium should be resorted to only when there are serious contraindications to operation or the patient refuses operation. In such patients periodic cytological studies and biopsies are essential. Of the 26 patients with both kinds of lesions, 6 were found to have the adenocystic type of hyperplasia plus adenocarcinoma; 6 showed the association of the adenomatous type with adenocarcinoma; 7 had both types of hyperplasia plus adenocarcinoma; and in the remaining 7 gradual conversion of adenocystic into adenomatous lesions and then into adenocarcinoma in periods of one to four years was observed. These findings indicate the existence of an endometrial carcinoma in situ.

UNITED KINGDOM

Rheumatoid Arthritis in Children.—Dr. F. Bywaters and his coworkers have compared the effectiveness of cortisone and aspirin in the treatment of rheumatoid arthritis in children. Thirteen of 25 children with the condition were given a maintenance dose of 50 to 100 mg. of cortisone daily, and the rest were given 0.2 to 0.4 gm. of aspirin daily, treatment being given in 12-week courses. The criterion of diagnosis was arthritis of the rheumatoid type, involving two or more joints. Assessment of improvement was based on functional capacity, the activity of the disease, the strength of the grip, a timing test while using hand-operated pegs or walking, tenderness of the joint, range of movement, sedimentation rate, hemoglobin level, and radiological appearances. Over the course of a year's treatment, there was

little essential difference between the two groups in any of the aspects observed. The mean figure after a year was slightly better in most respects in the group treated with aspirin. The effects of cortisone and aspirin paralleled those in the adult group of patients with rheumatoid arthritis reported by the Medical Research Council's committee in 1955.

Aminometradine in Treatment of Congestive Heart Failure.—The effect of a new orally given diuretic, aminometradine (Mictine, 1-allyl-3-ethyl-6-aminotetrahydropyrimidinedione), which is one of a series of substituted aminouracils, was examined by Platts and Hanley (*Brit. M.J.* 1: 1078, 1956). The effect of the drug on the flow of urine and excretion of electrolytes was studied in 20 patients with congestive heart failure and in 2 patients with heart disease but without edema, all of whom ingested 1,000 to 1,500 ml. of fluid and 0.5 to 5 gm. of salt daily. They were weighed each day and all urine collected over 24-hour periods. The volume and electrolyte content of the urine were measured during a control period. Most of the patients received 400 mg. of aminometradine daily, and, if this did not cause a satisfactory diuresis, the dose was increased to 800 mg. Treatment ranged from 2 to 11 days. Two patients with congestive heart failure received alternate doses of aminometradine and mersalyl, one day without any treatment being allowed after use of each diuretic.

The chief alteration in the acid-base composition of the urine caused by use of aminometradine consisted of an increased excretion of sodium and chloride ions. The excretion of potassium ions also rose, but not to such an extent as that of the sodium ions. The increased output of urine and increased excretion of sodium and chloride resulting from the administration of 400 to 800 mg. of aminometradine were somewhat less than those produced by an intramuscular injection of 2 ml. of mersalyl subsequently administered to patients who had received aminometradine therapy. Use of aminometradine alone produced a good therapeutic effect in eight patients with congestive heart failure, fairly good response in five, and a negligible result in five. It presumably inhibits reabsorption of sodium and chloride by the renal tubules, and the increased flow of urine is probably an osmotic diuresis occasioned by increased excretion of salt. The observations that maximum diuresis from aminometradine often does not develop until the third or fourth day of administration and that the diuresis lasts more than 24 hours suggest that a single dose of 400 mg. is not completely excreted in 24 hours. Platts and Hanley conclude that it is unlikely that aminometradine will supplant the mercurial diuretics in the treatment of severe congestive heart failure. The only toxic effects were nausea and vomiting.

Faith Healing.—Two years ago a commission on divine healing set up by the archbishops of Canterbury and York asked the British Medical Association whether there was any evidence that improvement or cure of disease, or accelerated recovery from illness, can result from spiritual ministrations. The findings of the B.M.A. committee (Divine Healing and Cooperation Between Doctors and Clergy, British Medical Association, 1956) state that no evidence was found that there is any special type of illness cured solely by spiritual healing that cannot be cured by medical methods not involving such claims. The committee often found that when cures claimed for spiritual healing were investigated the patient was at the same time receiving medical treatment, although this fact was not revealed by those claiming the "cures." It does acknowledge, however, that the value of religious ministration in the treatment of various disorders is great. Many of the cures effected by unorthodox methods, including faith healing, are mainly due to suggestion, which is more likely to be effective if it has a religious background. In cases of alleged spontaneous healing full details of diagnosis were requested, with special emphasis on the nature of the case, i.e., whether organic, with corroborative laboratory tests, mental, or psychosomatic. Many of the case histories would require substantiation before they could be regarded as evidence that anything more than what might be called normal healing had occurred.

The cure of disease is a relative matter. Freedom from symptoms or a remission is often thought to be a "cure" by the layman, whereas the medical standard is restoration of structure and physiological function. Disorders of psychological origin may be cured by methods affecting the mind and emotional state and may include spiritual healing, but the committee considers that it is undesirable and even dangerous to apply spiritual methods of healing without a knowledge of the nature of the disease from which the patient is suffering. Most of the "cures" of organic diseases claimed for spiritual healing may be classed as mistaken diagnosis or prognosis, alleviation or remission, spontaneous cure, or the result of combined spiritual and medical treatment. Thus, some cases diagnosed as epilepsy are really hysteria. Physicians often encounter illness that, on the basis of previous experience, should prove fatal but that appears to resolve unexpectedly without medical treatment. Some cancers have been reported to behave in this way. If such cases were treated by faith healing, they would be considered as "cures." When all the above possibilities are considered, it leaves little room for miraculous cures of organic disease by the methods of spiritual healing. In any event, spontaneous or unexpected cures that cannot be explained are rare.

Road Accidents.—The Ergonomics Research Society met in Bristol in April to discuss the causes of road accidents, which cost Great Britain 210 million dollars, 5,000 deaths, and 250,000 casualties annually. The problem of night glare was discussed. On the Continent colored lights are used at the expense of reduced visibility. The Anglo-American aim is to have as large a range of vision as possible, but with the light directed away from the eyes of the oncoming driver. Glare is mostly due to badly aimed light beams: 20% of the cars in Great Britain are badly maintained in this respect, as compared with 2% in Washington, D. C., where inspection of headlights is compulsory. Polarized windscreens and glasses have the disadvantage that they reduce vision too much. Prof. G. Drew of Bristol described tests on a simulated car journey by subjects after taking from 0.2 to 0.65 gm. of alcohol per kilogram of body weight. Steering error, speed, and probable accident rate increased with rising blood alcohol. Prof. L. Goldberg of Stockholm said that in Sweden 8.8 of the men over 25 years old and 4 or 5% of all drivers given sentences were problem drinkers. In a five-month investigation in Sweden it was found that in traffic accidents occurring on Saturdays 70% of drivers involved had alcohol in their blood and 33% were problem drinkers. Of deaths among motorcyclists, 80% were due to head injury. More information is needed on the mechanics of concussion. Protective crash helmets have diminished the risk of head injury and the number of deaths among motorcyclists. Prof. R. McFarland of Boston said that, in the United States in fatal car accidents and in accidents in which the car overturned, one or more doors opened in 75% of the cases and one occupant in three was completely ejected. One-third of those ejected died. Ejection more than doubles the chance of serious injury or death.

Medical Ethics.—At a recent meeting the central ethical committee of the British Medical Association considered that with few exceptions all physicians appearing on radio or television should be anonymous. It was conceded that in exceptional circumstances this rule might be waived, as, for example, when a physician discussed medicopolitical matters of national interest. The committee believes that anonymity should be preserved in all branches of medicine. There is a type of program in which

members of the public discuss clinical details of cases and receive comments from a panel that includes physicians. The committee believes that such programs could have serious consequences and be detrimental to the patient and public. An inquiry was received by the committee on the ethics of controlled therapeutic trials. In the case under review it was proposed to test the effect of progesterone implants in women who had had repeated miscarriages, by treating alternate patients with implants of the test substance or an inert compound. Under the conditions of a controlled trial, it would not be possible to explain the nature of the investigation to the patient. In law and medical ethics, a physician must not treat a patient without his or her consent and the risks and nature of any treatment must be fully explained before obtaining consent. To conduct a controlled clinical trial without explaining the nature of the investigation to the patient would therefore be both illegal and unethical. The committee advised that a protest should be made by physicians in a certain locality where the ambulance authority had sometimes informed the police of the diagnosis of some patients sent to the hospital by a physician.

Influence of Adrenocortical Hormones on Gastric Secretion.—The influence of the adrenal cortex on gastric secretion has been studied by Dr. James Kyle and his co-workers (*Lancet* 1: 664, 1956). Gastric secretion in adrenal cortical hyperfunction (Cushing's syndrome) was examined in 11 patients, 8 before and 7 after surgical treatment. In six the operation was removal of 0.9 of one adrenal and all of the other, and in one patient it was limited to partial removal of a gland containing a critical adenoma. A satisfactory remission of the syndrome was obtained in all patients. Before operation the free-acid curve of a fractional test meal was higher than normal, the mean highest concentration being 61 units. After adrenalectomy the average free-acid curve was near the lower limit of normal, with a mean highest concentration of 25 units. A controlled investigation of the relation between gastric secretion and the excretion of 17-hydroxycorticoids, which was thought to be a more specific measure of adrenocortical function, was then carried out on 26 patients and 8 normal subjects. The highest concentration of acid obtained after a test meal was plotted against the 24-hour excretion of 17-hydroxycorticoids. Most of those with a high excretion of 17-hydroxycorticoids also had a high concentration of gastric acid. Hypersecretion was also produced by the administration of corticotropin or cortisone. In view of these results it is surprising that duodenal ulcers do not appear to have been observed in patients with adrenal cortical hyperfunction.

Artificial Insemination and Paraplegia.—A case of successful impregnation by the spermatozoa of a paraplegic with a complete spinal syndrome at the T-8 segment is reported by Dr. R. Spira (*Lancet* 1: 670, 1956). Ejaculation was obtained by injecting 0.2 mg. of neostigmine intrathecally at the L-4 and L-5 vertebral interspace, the injection being made slowly after mixing the contents of the syringe several times with the cerebrospinal fluid. An hour later erection followed by the ejaculation of spermatic fluid occurred. After improving the spermatozoa count by giving 25 mg. of testosterone daily for 14 days and 1,000 units of gonadotropin daily for four weeks, the injection of neostigmine was repeated and the ejaculate used for artificial insemination. Pregnancy and the delivery of a normal child resulted. Paternity was confirmed, as far as it was possible to do so, by blood tests. The neostigmine presumably acts on the undamaged spinal centers in the lumbar cord, below the level of the lesion, which control erection and ejaculation.

Synthetic Oxytocin.—Oxytocin, which was synthesized by du Vigneaud and his co-workers in 1953, is a complex polypeptide formed from tyrosine, isoleucine, cystine, asparagin, glutamine, proline, leucine, and glycine. Animal assays indicate that it is equal in potency to the international standard preparations of posterior pituitary powder. Clinical trials with the synthetic material were made by Bainbridge and his co-workers (*Brit. M. J.* 1:1133, 1956). In an antepartum investigation in which an electrical pressure transducer was used to record pressure in the cervical canal, the effects produced by natural and synthetic oxytocin were qualitatively similar. The synthetic hormone was also assayed against the natural product. It was used in intravenous infusions given for uterine inertia, the contractility of the uterus being recorded continuously with an electric tocograph, and in patients post partum on the second and third days after delivery, activity being measured by the time taken for the tocograph tracing to return to normal. No qualitative or quantitative differences between the two compounds were demonstrated, nor were any side-effects encountered from the doses given. Drs. H. and W. Francis also examined the effect of a continuous intravenous drip on the synthetic hormone in 31 patients near term or in labor, using a Lorand tocograph in the first and second stages of labor (*Brit. M. J.* 1:1136, 1956). In 17 the action was compared with that of the natural product by alternate administration for 20-minute periods. The actions of synthetic and natural oxytocin were indistinguishable. The synthetic product had slight pressor activity, but this was not sufficient to contraindicate its therapeutic use.

Smoking and Lung Cancer.—Prof. Bradford Hill and Dr. R. Doll of the research unit of the Medical Research Council, who have carried out most of the epidemiological work on the association between tobacco smoking and lung cancer, have answered 31 questions on the subject submitted to them by the editor of the *British Medical Journal*. They state that, even allowing for improved methods of diagnosis, cancer of the lung has increased in the last 10 years to a much greater extent than any other form of cancer. In reply to the question whether statistical evidence proves that cigarette smoking directly causes cancer of the lung, they reply in the negative, but they believe that such a relationship is likely and that the risk of dying from lung cancer is directly proportional to the amount smoked, although it is agreed that the disease occurs also in nonsmokers. It is estimated that about 9% of 25-year-old men who smoke 25 to 50 cigarettes daily might be expected to die of lung cancer before they reach the age of 75. The chance of dying of lung cancer is diminished in a heavy smoker if he gives up the habit in middle age, or if he smokes a pipe only. Some protection seems to be afforded by cigarette holders or filter tips. The smoking of hand-rolled cigarettes affords no protection. There is no evidence that the use of a flint-and-fluid lighter increases the risk. The possible role of atmospheric pollution in causing lung cancer is unknown. The disease occurs twice as frequently in the town dwellers as in those living in rural areas, but they also smoke more. There is no clear evidence that exhaust gases from vehicles, either diesel oil or gasoline driven, play a part, because taxi drivers, truck drivers, garage hands, and traffic police show no increased incidence of cancer of the lung. For countries with adequate statistics, there is little correlation between mortality from lung cancer and total tobacco consumption, but there is a close association in 10 countries when the consumption of cigarettes 20 years ago is related to the present death rate from lung cancer, with the notable exception of the United States, where the death rate is relatively low. In its editorial comment, the *British Medical Journal* said that, if cigarettes only killed outright like an automobile accident, the connection between cancer and smoking would be brought home to the public. The key persons in public propaganda against smoking are the general practitioner, the family physician, the school doctor, and the school teacher. It is essential to bring home to the youth of today the great dangers to life and health in smoking cigarettes.

CORRESPONDENCE

SYMBOLIC SHORTHAND FOR REGISTRATION AND FILING OF MEDICAL INFORMATION

To the Editor:—In view of the unprecedented increase in the volume of medical research during the last few decades, it has become increasingly more difficult to keep up with current progress, even in a limited field. I was first confronted with this problem as a medical student, when I realized the impossibility of taking adequate lecture notes about what had just been said while listening to what was being said. The only way I could cope with this difficulty was by substituting self-explanatory simple symbols for long technical words or complex descriptions of procedures. During the subsequent 30 years, this set of symbols developed into a system of shorthand for medical subjects. It has been of considerable assistance to me in taking notes during scientific congresses and in annotating the literature on stress and endocrinology (the principal subjects of research in our institute) for subsequent filing by office personnel not medically trained. It is this timesaving device that made it possible for us to prepare a detailed subject index for the 250,000 reprints and books that constitute our endocrinological research library. The indexing system itself has never been published, and, since I feel that it may be of some assistance to medical students, physicians and research men alike, I want to present at least an outline of it to the profession. In doing so I shall take my examples mainly from the field of endocrinology and stress research, with which I am most familiar, but naturally the same system can also be applied to other specialties and indeed to sciences other than medicine.

The first step is to establish an order of precedence, or the sequence in which topics are to be mentioned. This must depend upon the field of personal interest. In our library the material is arranged in the following sequence: (1) endocrines, (2) non-endocrine organs, (3) connective-tissue reactions, (4) infections and serologic reactions, (5) tumors, (6) metabolism, and (7) various topics not specifically mentioned above. While this is only a rough outline, it is obvious that if every possible subject has a well-defined "precedence rating" it can be found, even within the most voluminous file, just as easily as any one among the 600,000 entries is located in Webster's New International Dictionary by any reader familiar with the "order of precedence" in the English alphabet. Indeed, just as even words not yet coined have a place (and only one place) foreseen for them in the dictionary, so discoveries to be made in the future will fit quite naturally into a well-conceived system of scientific literature, in consonance with its order of precedence.

All possible medical subjects can be subdivided into static and dynamic observations. The former are purely descriptive (e. g., the normal morphology or chemical composition of an organ), while the latter are concerned with the response of a target to an agent (e. g., the response of a tumor to x-rays). The systematic registration of static observations presupposes only an order of precedence, while the manifold interactions, often complex, between targets and agents necessitate a more refined lexicographic procedure. The system we have developed employs self-explanatory symbols and simple abbreviations. These can rapidly be jotted down in a notebook during a lecture or on the corner of a printed article we happen to read, and they are much easier to remember than the customary numerical library codes. In our institute journals, reprints, books, and abstract cards, thus annotated by my associates or by myself, are then handed to office personnel. These employees (though not medically trained) have no difficulty in decoding our shorthand information sufficiently to type it out on handy, small index cards (height, 1¼ in.; width, 5 in.), which are then filed (according to the order of precedence) in convenient flat drawers. This provides an expandable subject index to the entire bibliographic system.

After a publication has been selected for indexing, it receives an accession number and is filed according to the author(s) by office personnel. Here I should merely like to give a few examples of the type of annotation the medically qualified person must then make himself on this entry. It will be seen that, with an adequate system of symbolic shorthand, it takes only a minimum of time and effort to jot down the symbols that enable an office assistant to index the material so that it can then always be easily located. For example, an article published by Smith in 1956 has received the accession number 27001. It contains purely static information concerning the histological structure of the chromaffin cells in the adrenals of normal human subjects. Only the scientifically qualified person can judge that this is the topic of the paper, hence he must annotate the article by jotting down on its corner (in handwriting) the remark:

Adr/Hi/Chromaffin cells/Man

This is then clearly typed out on an index card by the bibliographic assistant as follows:

Adr/Hi/Chromaffin cells/Man
Smith 27001/56

It is easy to keep in mind such abbreviations as "Adr" and "Hi," because they are reminiscent of adrenals and histology, while the two numerals after the accession number are a convenient indication of the year in which the paper appeared. The reprint itself can then be placed on a shelf in the simple numerical order of its accession number and is henceforth readily located, either through the alphabetic author file (if we look for works by Smith) or through the subject file (if literature on the histology of chromaffin cells is required).

To exemplify the annotation of a simple dynamic observation, let us consider an article by Smith and Klein published in 1956 and given the accession number 33001. It deals with morphological changes obtained in the adrenals of rats (R) by treatment with corticotropin (ACTH). Here we have a single simple target influenced by a single simple agent. In our system the target is always mentioned first; hence the scientist will annotate:

Adr ← ACTH/R

The assistant will write:

Adr ← ACTH /R
Smith and Klein 33001/56

Now take a paper that describes the effect of corticotropin upon the basal metabolic rate (BMR), the erythrocyte sedimentation rate (ESR), and the temperature (Temp) in normal human beings. Here we have several single targets influenced by a single simple agent, and the most timesaving way to annotate this would be:

BMR
ESR ← ACTH/R
Temp

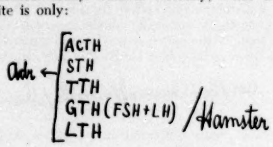
The assistant will then have to prepare three subject cards, so that each observation may be individually registered in the particular place foreseen for it according to the order of precedence in the drawers of the file. These cards will read:

BMR ← ACTH /Man
Johnson 31074/56

ESR ← ACTH /Man
Johnson 31074/56

Temp ← ACTH /Man
Johnson 31074/56

An example of a single simple target being influenced by several simple agents is a paper describing the effect upon the hamster's adrenals of treatment with corticotropin (ACTH), somatotropin (STH), thyrotropin (TTH), a gonadotropin (GTH) mixture [containing both follicle-stimulating hormone (FSH) and luteinizing hormone (LH)], and luteotropin (LTH). All this is described in the same article, but we are not dealing with a compound treatment; the effect of each hormone was examined on separate groups of animals. It would seem that a very extensive description of the paper (at least as much as I just said about it) would have to be written out by the scientist to permit filing of all this information by an assistant nontechnically trained. Actually, what the scientist should write is only:



This will enable the assistant to break down the information into five cards this way, to show that actually we are dealing with five separate experiments:

Adr ← ACTH /Hamster
Scott 23123/48

Adr ← STH /Hamster
Scott 23123/48

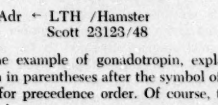
Adr ← TTH /Hamster
Scott 23123/48

Adr ← GTH (FSH+LH) /Hamster
Scott 23123/48

Adr ← LTH /Hamster
Scott 23123/48

As shown by the example of gonadotropin, explanatory remarks can be given in parentheses after the symbol of the agent, without changing for precedence order. Of course, the same is true whenever explanations are necessary concerning special features of the target. It is inadvisable to burden our memory by establishing abbreviations for comparatively uncommon topics. For instance, in our file, such common laboratory animals as the rat (R), guinea pig (gp), or mouse (M), are represented by abbreviations, but the less commonly used hamster is not.

Frequently, the same paper may deal with several targets as affected by several agents. For instance, in the same communication there may be evidence concerning the effect of heat and of anoxia on both the adrenals and the thyroid of a guinea pig. Here we have several single targets affected by several single agents. Again, the handwritten annotation may be quite simple:



However, it will require four separate typed cards to file the evidence properly according to the precedence order of each entry, like this:

Adr ← Temp↑ /Gp
Miller 27944/50

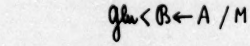
Adr ← O_2↓/Gp
Miller 27944/50

Tr ← Temp↑ /Gp
Miller 27944/50

Tr ← O_2↓/Gp
Miller 27944/50

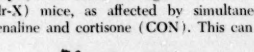
The symbols for thyroid (Tr), for a rise in the surrounding temperature (Temp↑), or for hypoxia (O_2↓), are all rather self-explanatory.

We may now turn to the case of a single compound target influenced by a single simple agent. This is exemplified by a paper that describes the changes in the glucose (Glu) content in (<) the blood (B) that occur after treatment with adrenaline (A) in the mouse (M). It may simply be annotated:

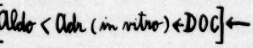


Data can be typed on a filing card in the same manner (except that author, accession number, and year of the publication will also be listed in the usual manner).

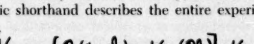
Frequently, both the target and the agent are complex, for example, when the blood sugar is examined in adrenalectomized (Adr-X) mice, as affected by simultaneous treatment with adrenaline and cortisone (CON). This can be annotated:



The same system of symbolic shorthand can also be applied to the most complex targets. For example, assume that aldosterone (Aldo) production in the adrenals is examined after the addition of desoxycorticosterone (DOC) as a substrate to rat adrenal tissue in vitro and that the adrenals (whose ability of converting desoxycorticosterone into aldosterone is thus examined) have come from rats that had previously been treated with subcutaneous injections of corticotropin. All this can be concisely and rather unequivocally written in a single line of symbolic shorthand:



If, on the other hand, a target is influenced by a complex agent (the preparation of which is actually part of the experiment) and even if this agent is but one component in a compound treatment procedure, the system is still readily applicable. As an extreme case, let us consider a publication that deals with the effect of an antikidney serum upon the renal tissue of partially nephrectomized rats kept on a high-sodium-chloride diet. The serum was prepared by the Masugi method, that is, rabbit kidney-tissue was injected into ducks and induced in the blood of the latter the appearance of nephrotoxic antibodies specifically directed against kidney-tissue. It may seem virtually impossible to explain such a complex experiment to an assistant not medically trained. Actually, a one-line annotation in symbolic shorthand describes the entire experimental arrangement:



The abbreviations that we have not yet encountered [kidney (Ky), rabbit (Rb), partial nephrectomy (Ky-xp), and excess administration of sodium chloride (Na Cl↑)] are all quite self-explanatory.

What helped us in the shorthand coding of the two last-mentioned procedures was the use of square brackets. In the case of targets or agents, which are themselves the result of an experimental operation, the method of their preparation can thus be described with the usual shorthand symbols, but as a separate unit. The square brackets indicate that the final product is one, though its preparation may necessitate a complex procedure. Any number of agents (whether complex or simple) can then be listed in the usual precedence order, connecting them with each other by plus signs (+). This is important, because in our system the action of several agents on one target would be filed on one card, as a single shorthand expression, while, if the effect of an agent upon several targets is considered, a separate card would have to be prepared for each target structure.

It should be mentioned in closing that this system was devised merely for the classification of observations; it is not meant to indicate the direction of the changes observed. However, if it is desired to register such additional information, this can easily be done with arrows placed just before the target. Thus ↑Glu <B would indicate hyperglycemia, ↓Glu <B hypoglycemia and ↑↓Glu <B an initial rise followed by a drop in the blood sugar level.

Of course, everybody who uses our system will wish to modify it somewhat to fit his personal interests. But the experience of many years has shown that the basic principles of this symbolic shorthand are readily adjusted to the problems and economic means of the medical student, the practicing physician, the specialized research worker, or the well-endowed large institutional library. Indeed perhaps the time has come when, for certain purposes, we may have to develop a special script for medical topics, a set of shorthand symbols that correspond to the structure formulas and equations of chemistry, the notes of music, and the symbols of algebra.

Hans Selye, M.D.
Institut de Médecine et de Chirurgie expérimentales
Université de Montréal
Montreal, Canada.

CURRENT MANAGEMENT OF HYPERTRICHOSIS

To the Editor:—This letter is being written as a plea to physicians and fellow dermatologists to give more thought to the management of hypertrichosis. Discussion with many dermatologists reveals that there has been a tendency to dismiss the problem as a matter of little consequence, particularly if there is no endocrine abnormality, or to rationalize that the tedious and prolonged course of therapy required for hair removal does not justify the time spent on these cases. To dismiss as a cosmetic problem the tendency toward excessive hair growth, particularly on the face of a woman, is as illogical as it is to dismiss the problem of acne as an inconsequential matter. Surely the patient with hypertrichosis is often psychologically more upset than the one with acne, since there is the implication of masculinization and all its accompanying connotations. Many such patients have remarked that they felt they were developing into "freaks." Undoubtedly, the sensitive patient feels very strongly about the matter and is more than willing to endure any discomfort associated with the procedure of hair removal. It is also obvious that the "hands off" attitude adopted by most physicians has shifted treatment (which most patients are determined to get) to a group of individuals with little or no medical background and, for the most part, with little insight into the total problem.

It is unfortunately true that very few states have any licensing requirements, and an individual has only to buy a machine to set himself up as an electrologist. Most of these individuals operate completely without medical supervision or control. Many of them advertise in the most flagrant manner and claim fantastic results (for example, "painless," "as many as 1,600 hairs per hour," or "no recurrence"). It should be pointed out that the procedure is neither painless (although by injection of procaine the discomfort can, to a large extent, be reduced) nor can more than about 150 to 300 hairs be removed per hour if the technique is to be careful and skillful. The recurrence rate is probably in the neighborhood of 20 to 30% by the best known technique. Not content with hair removal, some electrologists go further. For example, in the classified sections of the telephone directories in some cities, their advertisements blandly announce that they remove "moles and warts" and the bolder ones have added "birthmarks and kindred skin blemishes," "acne," and "fungous growths." I need not point out how dangerous this excursion into the field of diagnosis and nonmedically supervised therapy of such lesions can be. Others have placed the designation of "doctor" before their names and have used degrees such as C.E., N.D., M.M., C.Th., C.T., and D.M. Many imply endorsement of a personal physician, and one states that "75% of our customers (sic) come to us from doctors and dermatologists." The latter fact may be true. *Reductio ad absurdum* is the manufacture of machines for self-use by one company, which claims they have been rather widely sold.

It is, of course, self-evident that hypertrichosis is not infrequently a manifestation of endocrine disorder and that, in all cases, an adequate history, physical examination, and, if necessary, appropriate laboratory studies are important to determine, if possible, the reason for excessive hair growth. One wonders how many cases of endocrine disorders go untreated simply as a result of this "hands off" attitude. At the present time we are confronted with the curious anomaly that a field of diagnosis (difficult at best) and therapy (also a challenge) is being delegated by default, indifference, or actual physician referral to medically untrained individuals.

Not all those engaged in the procedure of electrolysis make unrealistic claims. A significant group has obtained instruction at schools of electrolysis that have a certain amount of medical supervision. Also, to their credit, the course of instruction is limited to the technique of hair removal only. On the other hand, many individuals who are so taught or who simply "go into business" employ this procedure with no medical supervision and, consequently, are unable to evaluate the problem of diagnosis and medical control. For the most part, a symptom or sign is being treated, rather than the medical problem as a whole. Moreover, damage resulting from the improper use of electrolysis or short wave (diathermy) units tends to discredit the only known method for successful hair removal. The feeling that the procedure is too tedious and time-consuming to be practical in a physician's office is not valid, in that a nurse or technician can be properly trained to carry out the procedure after medical evaluation of the problem has been made, or a physician or several physicians may employ or supervise a properly qualified, trained electrologist to carry out the technique.

Patients should be educated to "see the doctor first" and to learn that often hirsutism or hypertrichosis is a medical problem. Physicians should be prepared to accept the responsibility; the technique of hair removal should be carried out in the physician's office or under his supervision elsewhere. In actual practice, patients in need of electrolysis may be scheduled during an "off time" with the physician perhaps only "looking in" now and then. It is logical to assume that patients would prefer to have physician supervision rather than nonmedical management. It is true that some aspects of the procedure may fall into the category of cosmetology, i. e., removal of hair on arms, legs, or eyebrows. This type of work can be delegated to an ethical electrologist after the physician has adequately determined the medical status. This letter is not being written to imply an unqualified endorsement of the procedure of electrolysis, nor to discredit it, but merely to point out how the problem is being handled at the present time. Certainly, there is a need for further research into more effective means of hair removal, but, until such an improved method is available, it is our responsibility to utilize the most accepted technique. It is felt that the machine should be especially designed for this procedure only (whether electrolysis or short wave). All possible safeguards should be employed to minimize potential damage. Factors that can be mechanically controlled, such as automatic timing, upper limits of current, and proper calibration, should be incorporated into the design. With these safety devices and with properly supervised training and technique, the procedure can be safe and effective. It will afford considerable satisfaction in terms of grateful patients.

Harry Pariser
708 Medical Arts Bldg.
Norfolk 10, Va.

MISCELLANY

HERMANN BOERHAAVE AND SAMUEL JOHNSON

Jerome M. Schneck, M.D., New York

When reading about Hermann Boerhaave I find almost invariably an inseparable description of his medical achievements and his attractive personality. Although enthusiasm about the former may be more subdued in certain references, acceptance of the latter seems never in dispute. This suggests to me that the personality of the man, as viewed by many, constitutes perhaps an integral part of the image of Boerhaave, the great physician. In fact, this image as it has come to us through the years may well have been perpetuated by personality attributes rather than by what we may consider, although perhaps artificially, his more impersonal medical accomplishments.

Accounts about Boerhaave and references to him recall for me a verbal portrait drawn by the famous Samuel Johnson. The portrait is so striking that I believe it deserves to be included in medicohistorical literature because it supplements and enlarges the total impression of this classic figure. Of interest is the fact that Johnson's description was not encountered in a medical work. It was included in a volume of essays and studies assembled by an assistant professor of English for undergraduate study.[1] This excerpt from a larger account about Boerhaave was placed under the group of sketches titled "A Little Group of Interesting People." It is probably one of the earliest encounters of numerous premedical students with a physician of importance in the history of medicine—but more of this later.

References to Boerhaave's appealing personality are easy to find. Major[2] refers to him as genial and charming. Robinson[3] writes of his mildness and kindness, his generosity and lack of professional envy. He comments on his unblemished character and calls him warm-hearted and clear-thinking. For Singer,[4] Boerhaave was "that most humane of physicians." Sigerist[5] tells of men like Vesalius, Harvey, and Morgagni remembered as scientists for their lasting contributions, whereas Osler, Sydenham, and Boerhaave are remembered not for discoveries but as "great doctors, because in the people's opinion they came closest to the medical ideal of their time." Finally, Garrison,[6] commenting on the stories about Boerhaave, states, "The anecdotes about his fame reaching to China and his capacity for making monarchs wait only go to show that his influence was largely one of personality, a personality which was kindly, dignified, and unassuming."

Some facts about Boerhaave's activities are mentioned now as background data. Several sources have been used as noted, including the recent work by Major.[2] Hermann Boerhaave (1668-1738) was born at Voorhout. The son of a clergyman, he studied theology and received a doctorate in philosophy in 1690 at Leyden and a doctorate in medicine in 1693 at the University of Harderwyk. He practiced in Leyden, became a lecturer in the theory of medicine, and, in 1709, became professor of medicine and botany at the university. He became very well known as a teacher and physician, and attracted students from many parts of Europe. The number and reputation of his students was great, and Major, as well as others, thinks of Haller as the most famous. Boerhaave wrote several works, including "Institutiones medicae" and "Aphorismi de cognoscendis et curandis morbis." His writings were read and quoted widely in his time. Telling about Boerhaave as an eclectic in his medical theories, borrowing from iatrophysicists and iatrochemists, Major says, "All life, he taught, was the result of movement of the 'solids' and of the 'fluids' of the body; disease was a disturbance of this movement either in the solids or in the fluids."

Clinical Assistant Professor of Psychiatry, State University of New York College of Medicine at New York City.

Boerhaave as a Physician

Boerhaave was known widely as a clinician. Among the attractions for students were not only his lectures and personality but his bedside teaching. It may be mentioned parenthetically, although this fact is so frequently stressed, that he held Sydenham in great esteem, "on almost the same eminence as Hippocrates himself." Boerhaave used a thermometer for taking patients' temperatures and a hand lens to study secretions. Regarding his clinical facilities and activities, Sigerist has said, "On 12 beds half the physicians of Europe were trained!"[2] Regarding the bedside student-patient relationship, Brodman[7] notes that the medical "rounds" method was first conducted by Sylvius in 1683 and later reintroduced by Boerhaave. With this plan, the student would conduct the examination of the patient, make a tentative diagnosis, and prescribe treatment. Discussion and corrections by Boerhaave would follow. Singer[4] notes that Boerhaave demonstrated the lesion-symptom connections in postmortem examinations of his patients and thus introduced the modern method of medical instruction.

Boerhaave brought Albinus to Leyden and edited with him the collected works of Vesalius. He is considered a man of wide learning. In addition to Singer's tribute to Boerhaave as an influential teacher with clinical acumen, he evaluates him as one with "balanced vision," an "eagerness for new knowledge," and writes of "his sanity, his humanity, his generosity, and his prophetic power." Robinson speaks of Boerhaave transferring "medical supremacy" from Padua to Leyden, and Osler,[8] with his well known interest in Boerhaave, commented, "What was known as the first Vienna School in the eighteenth century was really a transference by van Swieten of The School of Boerhaave from Leyden."

As I implied earlier, the tributes to Boerhaave's personality, and its retention and perpetuation as an ideal, are intimately allied with his medical attainments, although evaluations of the latter have been modified with time. For example, Robinson claims he was not fertile in discovery or great in original investigations. He says his role was that of an interpreter of accumulated knowledge. More pointedly, Major notes that Boerhaave's writings, which had great vogue in his time, demonstrate little originality and are mostly forgotten. They are not among the still profitably read 18th century books. More blunt is Haggard's[9] assertion that, although Boerhaave's reputation spread throughout the world, it is doubtful whether he advanced medical progress. Despite these qualified evaluations, Haggard calls him the greatest clinician of the 18th century, Major quotes Haller's description of him as "the general teacher of all Europe," and Robinson says that by 1731 he was the world's most famous physician, the "medical arbiter of his age," and "Holland was the schoolmaster of Europe." Furthermore, Singer says that Boerhaave must be considered the greatest physician of modern times, and Osler,[8] in an address before the Royal Medical Society in Edinburgh, when referring to some of Boerhaave's pupils, called him "the Dutch Hippocrates."

This total picture of Boerhaave, the man, must certainly be one-sided, but I have no intention to deflate the image. For surely it is an image, and I suggest that the ingredients of personality appear to influence considerably the very fact that Boerhaave, as we read of him, continues with us today. It is in keeping with this view that I return to the sketch mentioned earlier, the description by Samuel Johnson. This account, essentially a panegyric, is so striking, finely written, and very much more complete than is usually encountered that it seems worthwhile to include it among the sum total of opinions and impressions, medical and personal, of this famous doctor.

Johnson's Biography of Boerhaave

Johnson's sketch is part of his "Life of Dr. Herman Boerhaave," published in four parts in *Gentleman's Magazine*, 1739.[10] Samuel Johnson (1709-1784) was still a young man when Boerhaave died, and it was shortly thereafter that this sketch was published. Clifford,[11] the most recent biographer of Samuel Johnson, says that he appeared to identify himself in some ways with Boerhaave's characteristics and experiences

but that there are obvious differences such as the capacity to make enemies. Some of the brief references by Clifford to Boerhaave and Johnson were based clearly on the text of the Johnson sketch, as is evident when one reads the biography itself. One example is the content of this life of Boerhaave, in which connection Johnson stated in an introductory paragraph, "We could have made it much larger, by adopting flying Reports, and inserting unattested facts; a close adherence to Certainty has contracted our Narrative, and hindred it from swelling to that Bulk, at which modern Histories generally arrive." (In this quotation and in a few to follow, I have retained the original punctuation, capitalization, and spelling, but have omitted the frequent italics and ignored characteristics of obsolete type.)

It is tempting to mention at this point that in a reference [12] to Johnson's "Life of Richard Savage," it has been claimed that he was able to achieve what he considered to be an important requirement of a biographer: "Nobody can write the life of a man, but those who have eat and drink and lived in social intercourse with him." Presumably he arrived at this conclusion after his sketch on Boerhaave was published. What he thought about this in retrospect is not evident.

Returning to Johnson's biography of Boerhaave, and whether we were to agree or disagree with these views, certain additional comments are of interest: "It is, I believe, a very just observation, that Men's Ambition is generally proportioned to their Capacity. Providence seldom sends any into the World with an Inclination to attempt great Things, who have not Abilities likewise to perform them. To have formed the Design of gaining a compleat Knowledge of Medicine by way of digression from Theological Studies, would have been little less than Madness in most Men, and would have only exposed them to Ridicule and Contempt. But Boerhaave was one of those mighty Geniuses, to whom scarce any thing appears impossible, and who think nothing worthy of their Efforts but what appears insurmountable to common Understandings."

Scattered through this life of Boerhaave are references to his insatiable curiosity after knowledge, his love of truth, and his patience. "He was too sensible of his Weakness to ascribe any thing to himself, or to conceive that he could subdue Passion, or withstand Temptation by his own natural Power; he attributed every good Thought, and every laudable Action to the Father of Goodness. Being once asked by a Friend, who had often admired his Patience under great Provocations, whether he knew what it was to be angry, and by what means he had so entirely suppressed that impetuous and ungovernable Passion? He answered, with the utmost Frankness and Sincerity, that he was naturally quick of Resentment, but that he had, by daily Prayer and Meditation, at length attained to this Mastery over himself."

Smith,[1] in his "Essays and Studies," comments at one point that we are so familiar with well-known writings about Samuel Johnson, it is well to be reminded that he himself was no mean writer, that his style was vigorous and clear, and that he knew much about human nature. In concluding, I quote now in full the same excerpts from the "The Life of Dr. Herman Boerhaave" that were reproduced in Professor Smith's book.

"Thus died Boerhaave, a man formed by nature for great designs, and guided by religion in the exertion of his abilities. He was of a robust and athletick constitution of body, so hardened by early severities, and wholesome fatigue, that he was insensible of any sharpness of air, or inclemency of weather. He was tall, and remarkable for extraordinary strength. There was, in his air and motion, something rough and artless, but so majestick and great, at the same time, that no man ever looked upon him without veneration, and a kind of tacit submission to the superiority of his genius.

"The vigour and activity of his mind sparkled visibly in his eyes; nor was it ever observed, that any change of his fortune, or alteration in his affairs, whether happy or unfortunate, affected his countenance.

"He was always cheerful, and desirous of promoting mirth by a facetious and humorous conversation; he was never soured by calumny and detraction, nor ever thought it necessary to confute them; 'for they are sparks', said he, 'which, if you do not blow them, will go out of themselves.'

"Yet he took care never to provoke enemies by severity of censure, for he never dwelt on the faults or defects of others, and was so far from inflaming the envy of his rivals by dwelling on his own excellencies, that he rarely mentioned himself or his writings.

"He was not to be overawed or depressed by the presence, frowns, or insolence of great men, but persisted, on all occasions, in the right, with a resolution always present and always calm. He was modest, but not timorous, and firm without rudeness.

"He could, with uncommon readiness and certainty, make a conjecture of men's inclinations and capacity by their aspect.

"His method of life was to study in the morning and evening, and to allot the middle of the day to his publick business. His usual exercise was riding, till, in his latter years, his distemper made it more proper for him to walk: when he was weary, he amused himself with playing on the violin.

"His greatest pleasure was to retire to his house in the country, where he had a garden stored with all the herbs and trees which the climate would bear; here he used to enjoy his hours unmolested, and prosecute his studies without interruption.

"The diligence with which he pursued his studies, is sufficiently evident from his success. Statesmen and generals may grow great by unexpected accidents, and a fortunate concurrence of circumstances, neither procured nor forseen by themselves; but reputation in the learned world must be the effect of industry and capacity. Boerhaave lost none of his hours, but, when he had attained one science, attempted another; he added physick to divinity, chymistry to the mathematicks, and anatomy to botony. He examined systems by experiments, and formed experiments into systems. He neither neglected the observations of others, nor blindly submitted to celebrated names. He neither thought so highly of himself, as to imagine he could receive no light from books, nor so meanly, as to believe he could discover nothing but what was to be learned from them. He examined the observations of other men, but trusted only to his own.

"Nor was he unacquainted with the art of recommending truth by elegance, and embellishing the philosopher with polite literature: he knew that but a small part of mankind will sacrifice their pleasure to their improvement, and those authors who would find many readers, must endeavor to please while they instruct.

"He knew the importance of his own writings to mankind, and lest he might, by a roughness and barbarity of style, too frequent among men of great learning, disappoint his own intentions, and make his labours less useful, he did not neglect the politer arts of eloquence and poetry. Thus was his learning, at once, various and exact, profound and agreeable.

"But his knowledge, however uncommon, holds, in his character, but the second place; his virtue was yet much more uncommon than his learning. He was an admirable example of temperance, fortitude, humility, and devotion. His piety, and a religious sense of his dependance on God, was the basis of all his virtues, and the principle of his whole conduct."

26 W. Ninth St. (11).

1. Smith, F. M.: Essays and Studies: Prose Selections for College Reading, New York, Houghton Mifflin Company, 1922.

2. Major, R. H.: A History of Medicine, Springfield, Ill., Charles C Thomas, Publisher, 1954.

3. Robinson, V.: The Story of Medicine, Philadelphia, the Blakiston Company, 1943.

4. Singer, C.: A Short History of Medicine, Introducing Medical Principles to Students and Non-Medical Readers, New York, Oxford University Press, 1928.

5. Sigerist, H. E.: A History of Medicine, New York, Oxford University Press, vol. 1, New York, 1951.

6. Garrison, F. H.: An Introduction to the History of Medicine, with Medical Chronology, Suggestions for Study and Bibliographic Data, Philadelphia, W. B. Saunders Co., 1921.

7. Brodman, E.: The Development of Medical Bibliography, Baltimore, Medical Library Association, 1954.

8. Cushing, H. W.: The Life of Sir William Osler, New York, Oxford University Press, 1940.

9. Haggard, H. W.: Devils, Drugs and Doctors: The Story of the Science of Healing from Medicine-Man to Doctor, New York, Harper & Brothers, 1944.

10. Johnson, S.: The Life of Dr. Herman Boerhaave, Gentleman's Magazine and Historical Chronicle, 4 parts, January-April, vol. 9, 1739.

11. Clifford, J. L.: Young Sam Johnson, New York, McGraw Hill Book Co., Inc., 1955.

12. Samuel Johnson, in Collier's Encyclopedia, New York, P. F. Collier & Son, 1954, vol. 11, p. 436.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Indications for Commissurotomy in Mitral Stenosis. G. C. Griffith. Dis. Chest 29:605-615 (June) 1956 [Chicago].

If surgical intervention in patients with mitral stenosis is to be of the greatest value, it must be performed before irreversible changes in the heart and related structures occur. Progressive adaptation to the altered circulation may relieve for a time symptoms most indicative of the disorder; the physician must not be misled into accepting these changes as signifying improvement. The left atrium is distended and the entire lesser circulation is slowed in relatively pure stenosis. Both left atrial pressure and pulmonary venous pressure are exaggerated in atrial systole in patients with regular heart rhythm. Ventricular diastolic filling is accompanied by the typical stenotic murmurs.

Conditions that may mimic mitral stenosis include chronic failure of the left ventricle, constrictive pericarditis, congenital or acquired stenosis of the pulmonary veins, pedunculated tumor of the left atrium, intermittent obstruction caused by a free thrombus, hyperthyroidism, and interatrial septal defect. Laboratory examinations are helpful in the detection of rheumatic activity or subacute bacterial endocarditis, both of which present contraindications to surgical intervention. Cardiac size and configuration may be estimated by percussion, cardiac fluoroscopy, teleroentgenograms, esophagograms, palpation of the apex beat, angiocardiography, and unipolar lead electrocardiography. Murmurs at the mitral orifice may be studied with the aid of auscultation and phonocardiography; thrills may be palpated. Early physiological changes may be detected either by measuring the circulation time or by estimating the cardiac output, both at rest and after exercise, as calculated by cardiac catheterization. Catheterization of the left side of the heart allows measurements of pressure in the aorta, the left ventricle, and the left atrium, and thus yields valuable information for the evaluation of valvular lesions in regard to the feasibility of their surgical correction. At present, multivalvular lesions are considered inoperable. Patients in class 3 of the American Heart Association's classification of functional capacity, or patients in class 2 who are rapidly approaching class 3, are the best candidates for surgery. The most important factor in scheduling the operation is the rate at which the patient's condition is deteriorating.

Treatment of Atherosclerosis by Diet: Part I. Results in Patients Followed from 36 to 72 Month. A. M. Nelson. Northwest Med. 55:643-649 (June) 1956 [Seattle].

In an attempt to obtain long-term correction of blood lipids, 175 patients with either coronary artery disease or cerebrovascular accident were placed on a diet low in fat. They were followed up for from 36 to 72 months. One hundred ten were successfully treated in that either lowering of the blood cholesterol by more than 10% was maintained or raising of the phospholipid-cholesterol ratio by 20% was maintained. In 12 borderline patients, a mean cholesterol response level 7% lower than the initial cholesterol level coupled with a phospholipid-cholesterol rise of at least 12% was also considered a successful lipid change. Most of the successfully treated patients had simultaneous shifts from an initial average cholesterol level of 329 to an average of 270 mean response level. Phospholipid-cholesterol ratios were changed from an average of 79% to an average mean response level of 93%. In 26 patients the lipid levels did not change sufficiently to meet the above criteria, and the patients were regarded as therapeutic failures. Thirty-nine patients discontinued dietary therapy within an average of 12 months, most of them because the initial clinical improvement was so pronounced that they had lost their respect for the disease.

There was a definite lowering of the number of deaths in the patients with successful lipid correction; only 11 (10%) of the 110 patients died after an average of 50 months of treatment. Of the 26 patients who were therapeutic failures, 8 (31%) died after an average of 51 months of treatment. Of the 39 patients who discontinued dietary therapy, 12 (33%) died after an average of 53 months of therapy. In the group with successfully corrected lipid levels, the death rate was fairly uniform during the first three years. Only one death occurred in 98 patients treated for an average of 11 months during the final observation period, suggesting that with the passage of time greater immunity toward fatal attacks was gained despite the fact that the average age of the patients treated moved from 56 to 60 years. Death seemed to occur early in the therapeutic failure group. The death rate seemed to lessen in the patients in this group during the third and final year of observation. In patients who discontinued dietary therapy after an average treatment time of 12 months, deaths tended to occur at a higher rate in the third and final year. Successful lipid correction is no panacea for the treatment of coronary artery disease, and an occasional recurrence of symptoms can be expected normally. Fewer than one-third, however, of the successfully treated patients died or became invalids. These results are better than in those patients who discontinued dietary therapy, those who were therapeutic failures, or in patients with atherosclerosis treated by present symptomatic methods, which do nothing to attack the underlying disease, in whom the average American mortality rate prevails. The final answer to the important question as to the benefit of lipid control lies in the death rate resulting from recurrent attacks of vascular occlusion in each succeeding year after treatment has been started.

Sitosterol Administration in Normal and Hypercholesteremic Subjects: The Effect in Man of Sitosterol Therapy on Serum Lipids and Lipoproteins. B. A. Sachs and R. E. Weston. A. M. A. Arch. Int. Med. 97:738-752 (June) 1956 [Chicago].

The postulated relationship between dietary intake of fats, serum cholesterol level, and the pathogenesis of atherosclerosis has been the basis for the prophylactic use of diets low in fat and cholesterol. The recently demonstrated fact that orally administered plant sterols, without reduction of cholesterol and fat intake, can lower the serum cholesterol levels of animals and man provides a new approach to this therapeutic problem. This paper describes the effect of β- and dihydro-β-sitosterols on the serum lipids of human subjects. Nine studies, including double-blind experiments, on five normal subjects revealed an average mean fall of 13.0% and an average maximal fall of 20.9% in serum cholesterol level during sitosterol therapy. One subject with xanthomatosis exhibited a mean fall of 20.3% and a maximal fall of 31.5% in serum cholesterol level. Although her cholesterol level did not decrease to normal values, her S_f 10-30 lipoprotein fraction did. The xanthomata stopped growing during sitosterol therapy, but grew rapidly again when therapy was discontinued.

When sitosterol was administered, there was a rise in bile cholesterol concentration of a subject with biliary cirrhosis and a bile fistula. The significance of this observation cannot be evaluated, because the spontaneous fluctuations in bile cholesterol concentration over prolonged periods of time are not known. Subjects failing to take sitosterol immediately prior to eating did not exhibit sustained reduction in serum cholesterol levels. In some patients with disorders of lipid metabolism, a rise in serum cholesterol levels was noted during sitosterol administration. It is suggested that in these subjects either decreased absorption of cholesterol may stimulate increased

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1947 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

endogenous production or small amounts of sitosterol may be absorbed, poorly removed from the circulation, and spuriously analyzed as cholesterol in the serum. One of two patients with coronary artery disease exhibited a significant fall in serum cholesterol level, which subsequently rose after sitosterol was withdrawn. Additional studies are necessary to establish the clinical significance of the reported reductions in serum cholesterol levels during sitosterol therapy.

Outcome of Solitary Pulmonary Nodules Discovered in an X-Ray Screening Program. G. W. Comstock, R. H. Vaughan and G. Montgomery. New England J. Med. **254**:1018-1022 (May 31) 1956 [Boston].

This paper presents the experience of the authors with solitary pulmonary nodules detected in an extensive x-ray screening program in Muscogee County, Georgia. The records of 88 patients with such nodules were investigated. The median period of observation was 53 months. Solitary pulmonary nodules were observed more frequently among males than females, among white than among Negro patients, and among those over 40 than among those under this age. They were associated with histoplasmin sensitivity but not with tuberculin sensitivity. The four carcinomas that were detected were all in white men. Of the nodules demonstrated, five were tuberculous and two were granulomas of undetermined cause. The size of the nodules appeared to be an important diagnostic clue; of nine nodules with a diameter greater than 28 mm., three were carcinomas and three were tuberculous lesions. The presence of calcification or lamination also appeared useful: no carcinoma or tuberculosis was demonstrated among those with either of these features. Ten of the 88 persons are known to have died, 5 of them from causes apparently related to the pulmonary nodule. Three of the deaths were due to carcinoma and two to tuberculosis. The observed number of deaths was two to three times the expected number. Neither routine observation nor indiscriminate excision of the solitary pulmonary nodules can be recommended. Further knowledge of the fate of the patients with these lesions, whether excised or not excised, would help delineate the risk involved in various methods of treatment. With such information, the management of patients with solitary pulmonary nodules could be placed on a more rational basis than is possible at present.

Evaluation of the Methods of Treatment of Essential Hypertension. F. D. Murphy and E. G. Schulz. Postgrad. Med. **19**: 403-416 (May) 1956 [Minneapolis].

Not all patients with hypertension need to be treated with the more powerful modern hypotensive drugs: some are not benefited and some are even made worse. Reduction of excess weight, adjustment of occupation, changes of habit, and perhaps a minimum of drug therapy may be all that is needed. Patients with essential hypertension of grades 3 and 4, however, will always require more rigid treatment and may be greatly helped by judicious use of the newer drugs. The authors' plan, used in treating 59 selected patients with hypertension who have been followed for from four months to 15 years, has been to hospitalize the patients in the beginning and to start the treatment, except in severe cases, with Rauwolfia serpentina, the mildest of the hypotensive agents, in doses ranging from 50 to 100 mg. three times a day for three or four weeks. Patients whose blood pressure levels were unchanged at the end of this time were given either veratrum viride (Veriloid), beginning with 3 mg. a day, or hydralazine (Apresoline) hydrochloride, beginning with 50 mg. a day. Dosages were progressively increased until the blood pressure was lowered or the treatment had to be discontinued because of side-effects. The maximum dosage of 24 mg. of Veriloid or 800 mg. of Apresoline was continued for at least three months if the patient could tolerate it. Hexamethonium and pentapyrrolidinium (Ansolysen) were used for severe benign, premalignant, or malignant hypertension when other agents failed. Treatment with the blocking agents was often started with the parenteral form and then shifted to the oral form, the dosage in each case being adjusted to the response of the standing blood pressure. Combination therapy, i. e., the blocking agent and a Rauwolfia preparation, was used in almost all cases. Rauwolfia, which was often accompanied by unpleasant side-effects when used alone, was effective only when hypertension was mild. Apresoline was equally effective in both benign and malignant hypertension. Side-effects were apparent in 29 patients, 19 of whom had headache. Malaise was noticed by almost all patients when the dosage was increased over 300 mg. a day and was a prominent complaint in 11. Tachycardia almost always occurred, but could be reduced by the use of Rauwolfia. Arthralgia was severe enough to require withdrawal of the drug in four cases, and fatal agranulocytosis developed in one patient with benign hypertension who was on a moderate dosage for a short time. Veratrum was used in 17 patients, but in none was it possible to obtain a significant reduction in diastolic pressure. The toxic range of the drug was found to be too close to its therapeutic range in these patients, and treatment had to be discontinued in four of nine in whom nausea and vomiting occurred. Hexamethonium and Ansolysen, both of which were effective hypotensive agents, seemed to have similar effects on the blood pressure, but differed in the dosage required to produce them. Postural hypotension was the chief side-effect and was severe enough to cause collapse in some cases. Lowering of the blood pressure by the use of hypotensive agents does not provide a complete solution to the problem of hypertension; although the blood pressure itself is favorably affected, other essential conditions that are a part of the disease remain unaltered. Drastic surgical measures, however, such as sympathectomy and adrenalectomy, should not be used except in patients in whom adequate medical care has proved ineffective.

The L. E. Test in Patients Presenting the Clinical Picture of Rheumatoid Arthritis. S. W. Ross and E. K. Clardy. South. M. J. **49**:553-559 (June) 1956 [Birmingham, Ala.].

L. E. tests were performed in 91 patients who presented the features of a rheumatoid-like arthritis. The involvement of joints was graded according to the classification recommended by the American Rheumatism Association, and the findings indicative of involvement of cardiovascular, pulmonary, gastrointestinal, reticuloendothelial, and nervous systems and of mucous membranes were recorded. Of the 91 patients, 18 had a positive reaction to the L. E. test and 73 patients, divided into two control groups of 20 and 53 admitted to two different hospitals, had negative reactions to their L. E. tests. Fifteen of the 18 patients with a positive reaction had abnormalities in four or more systems, whereas 17 of the 20 patients and 45 of the 53 patients had one or no systems affected. These results uphold the reliability of reports that the incidence of system involvement is related specifically to the positive L. E. tests. The results do not otherwise clarify the relationship of systemic lupus erythematosus to rheumatoid arthritis.

Treatment of Herpes Zoster and Chicken Pox with Immune Globulin. J. G. Rodarte and B. H. Williams. A. M. A. Arch. Dermat. **73**:553-555 (June) 1956 [Chicago].

The virus recovered from chickenpox is identical in appearance and in size with that found in herpes zoster. The authors cite Simpson, who in 1954 demonstrated that, with respect to clinical manifestations, reproductive cycles, infectiousness of the disease, and immunity, ordinary chickenpox is identical with chickenpox contracted after contact with patients who have herpes zoster. The rationale of the treatment of herpes zoster with gamma (immune) globulin must be that if the subjective symptoms of herpes zoster are relieved and the morphological course of the disease is attenuated, this is due to neutralization of the virus by chickenpox virus antibodies present in the pooled immune globulin. The authors gave immune globulin to 11 patients with severe herpes zoster. All complained of constant paresthesias such as burning, itching, and boring and/or lancinating pain sufficient to incapacitate them and to interfere with their sleep. Each sought relief from discomfort, provided only temporarily by proprietary analgesics. The authors advocate that immune globulin (20 cc., intramuscularly) be given daily for a period of at least four days (10 cc. being injected high in each buttock daily).

Prompt, persistent relief from pain was obtained, and the skin lesions were modified. It is suggested that immune globulin may minimize posterior root ganglion and spinal cord damage

and thus prevent postherpetic neuralgia. Immune globulin was given also to five children with chickenpox during the first day of eruption. Examination of the skin lesions suggested that chickenpox could be attenuated in this manner. It is advocated that large doses of immune globulin be administered over a period of at least four days to patients with severe herpes zoster and over a period of three days to patients with chickenpox in order to evaluate the efficacy of this agent.

On the Pain Following Ingestion of Alcohol in Hodgkin's Disease. G. Alcozer and D. Azzena. Arch. "E. Marigliano" pat. e clin. 2:939-945 (Dec.) 1955 (In Italian) [Genoa, Italy].

The authors subjected 48 patients with lymphoglandular affections of neoplastic and metaplastic forms to oral and intravenous alcohol tests. Eighteen were affected with Hodgkin's disease, 9 with chronic leukemic lymphadenosis, 3 with lymphosarcomatosis, 4 with chronic leukemic myelosis, 2 with plasmocytomas, 10 with neoplasias of various organs, and 2 with generalized carcinosis. The test was positive only in three patients affected with Hodgkin's disease. One patient noticed that every time he drank alcoholic beverages an acute pain would follow after 5 or 10 minutes in the thoracic and in the sternal regions. The pain lasted from 30 to 40 minutes. The patient abstained from drinking alcoholic beverages. At a social gathering he became faint and was made to drink some cognac. The usual pain followed at once. After a week the skin of his chest became red. Some nodes formed on it that soon became blue and ulcerated. Another patient who developed pain after drinking wine was given the alcohol test, and after a month there appeared an adenopathy in the supraclavicular region; biopsy facilitated the diagnosis of Hodgkin's disease. The limited number of cases does not permit the authors to draw definite conclusions, but it seems that positive reaction to alcohol test results in people with Hodgkin's disease in about 16% of the cases. The test facilitates the discovery of lymphogranulomatosis that could not be discovered otherwise.

Thrombotic Thrombocytopenic Purpura: Review of the Subject with a Report of Three Cases in Children. S. A. Wile and P. Sturgeon. Pediatrics 17:882-896 (June) 1956 [Springfield. Ill.].

Three cases of thrombotic thrombocytopenic purpura are described in an 8-year-old boy, a 10-month-old girl, and a 5-year-old girl. The disease had an acute fulminating course in these patients. They died within a few days or weeks from the onset of their illness. A more rare chronic form of the disease marked by periods of remissions and relapses over several months to years, finally ending in death from an acute exacerbation, occurred in adult patients whose cases were collected from the literature. Thrombotic thrombocytopenic purpura is a distinct disease entity manifested clinically by fever, purpura, thrombopenia, hemolytic anemia, and bizarre transitory neurological signs and symptoms. The onset of the disease may be sudden or may be preceded by an infection, most generally of the respiratory tract. Malaise, fatigability, myalgia, arthralgia, dizziness, headache, anorexia, abdominal pain, vomiting, and diarrhea alone or in combination may be noted during the prodromal period. The disease is characterized microscopically by widespread occlusion of the arterioles and capillaries with an amorphous or granular acidophilic material, endothelial proliferation within the vessels, and the virtual absence of any inflammatory reaction in the walls of the blood vessels and adjacent tissues. The clinical diagnosis of thrombotic thrombocytopenic purpura is not difficult provided the symptomatologic triad of thrombopenia, hemolytic anemia, and neurological disturbances is borne in mind. In some cases, diagnosis can be made before death with the aid of the characteristic microscopic picture in paraffin sections of particles aspirated from the bone marrow or in biopsy specimens of the skin. The possibility of thrombotic thrombocytopenia purpura should be considered whenever an unusually severe or fulminating purpura associated with thrombopenia is observed.

No treatment has proved effective to date, and the disease has been fatal in every recorded case. Exchange transfusion was tried for the first time in the 10-month-old girl, and the temporary improvement noted in the blood picture might have been the result not only of the transfusion of blood but of the removal of circulating antibodies, as in exchange transfusion in hemolytic disease of the newborn. Although the use of corticotropin (ACTH) and cortisone seemed to be of little value, further trials with these hormones, using large doses and possibly combined with exchange transfusions, early in the course of the disease, seem to be indicated.

SURGERY

Endocrine Therapy of Metastasizing Carcinoma of the Breast. A. Walser. Schweiz. med. Wchnschr. 86:497-501 (May 19) 1956 (In German) [Basel, Switzerland].

Endocrine therapy is described by the author as hormone treatment with androgens, estrogens, cortisone, and cortisone-like steroids as well as surgical removal or irradiation treatment of ovaries, adrenals, and hypophysis. A temporary remission or arrest of the growth of the tumor may result from each of these types of therapy. Changes in the hormone balance prevent or slow down the growth of the tumor until it becomes adjusted and starts to grow again. Recent experiences have shown that each type of hormone treatment or each surgical intervention is effective only once. It is, therefore, of utmost importance that in every individual case a therapeutic plan should be laid down by specialists in close cooperation, i. e., by the surgeon, gynecologist, radiologist, pathologist, neurosurgeon, internist, and endocrinologist. They must take into consideration whether the patient has an estrogen-dependent or a nonestrogen-dependent breast cancer, terms suggested by Pearson and co-workers in a paper that appeared in THE JOURNAL (154:234 [Jan. 16] 1954).

Ovariectomy is the method of choice in women with metastasizing cancer of the breast before the menopause. Further therapy depends on whether the ovariectomy results in a remission, which occurs in almost 50% of the patients. After the effect of the ovariectomy subsides, administration of androgens or adrenalectomy should be practiced in patients with estrogen-dependent tumors. In certain cases, the less active, but well-proved androgen therapy may be preferred to the radical removal of the adrenals. A further remission may be obtained with late cortisone therapy with large doses of the drug. Hypophysectomy takes the last place in the therapeutic plan, but it should also be considered as a substitute for adrenalectomy in patients in whom the latter surgical procedure is not feasible. When remission does not result from ovariectomy, improvement may not be expected in most patients from adrenalectomy either. Inhibition of adrenal and pituitary activity may then be obtained by cortisone therapy and later by administration of estrogens. Hypophysectomy is the least effective method in cases of this type.

The succession of therapeutic methods in women after the menopause is the same as in those before the menopause. Since remissions are obtained less frequently by ovariectomy in women after the menopause, many authors recommend combined ovariectomy and adrenalectomy. The principle of a therapeutic plan applies to every patient, but the succession of the various forms of treatment can be varied according to the requirements of the individual patient. Since endocrine therapy has only a palliative effect, it is important that this therapy should be carried out step by step so that full use is made of the effect of one hormone or of one surgical intervention. The treatment of patients with metastasizing carcinoma offers a most difficult problem to the physician, a problem that is also ethical and social. It is essential to keep in mind that carcinoma of the breast is not a local disease of the mammary gland but a disease of the entire body.

Surgery for Pulmonary Cancer: A Declaration of Dividends. R. H. Overholt and J. A. Bougas. Dis. Chest 29:595-604 (June) 1956 [Chicago].

Of 588 patients with microscopically confirmed pulmonary cancer who were observed between 1932 and 1950, 204 (35%) had resections, with an over-all mortality of 15%. Forty-six of these (23%) survived five or more years without any evidence of recurrence. Of 80 patients who had resections of cancer that had extended grossly outside the lung, 4 (5%) survived five years or more. Of 44 patients who had resection of cancer that had spread to mediastinal lymph nodes, 10 (22%) survived five years. Thirty-two (40%) of the 80 patients with resections of localized pulmonary cancers lived five years. Of the 46 patients who survived five years, 34 had epidermoid cancers, 7 undifferentiated cancers, and 5 had adenocarcinomas. Epi-

dermoid cancer treated before there is gross or microscopic evidence of extension beyond the lung gives the best prognosis. Seven of the 46 five-year survivors were treated for tumors with higher grades of malignancy, which thus proved to be not always hopeless. Palliative surgery may turn out to be corrective. Over 10% of those originally considered hopeless have been saved. The extent of the resection must depend on the location and character of the lesion as well as on the functional capacity of the contralateral lung. A limited resection has proved to be adequate and a preferable method of management for selected patients, such as those with incurable cancer who were relieved of incapacitating symptoms and a few in whom the entire tumor could be removed by the limited resection.

Excision of the Internal Mammary Chain in Radical Mastectomy: Results in 57 Cases. R. S. Handley, D. H. Patey and B. H. Hand. Lancet 1:457-461 (April 21) 1956 [London, England].

The authors describe a new technique for excision of the internal chain of mammary lymph nodes in primary operations for carcinoma of the breast. The method differs from others chiefly in that it preserves the entire pectoralis major muscle. The authors so far have treated 57 patients by some form of therapeutic removal of the internal mammary chain. The new technique here described was not used in all of these cases; for instance, three patients were operated on according to Urban's technique, and some underwent excision of the sternal head of the pectoralis major muscle. There was no operative death. The patients were carefully selected. The primary tumor was in the inner hemisphere of the breast in 46 of the patients, in 9 it was a central growth, and in only 2 it was in the upper outer quadrant of the breast. The disability, deformity, and morbidity of this operation were no greater than after the classical radical mastectomy. Invasion of the internal mammary lympathic chain was found in 23 cases (40%). It will not be possible to assess the value of the operation in terms of a cure-rate until more time has elapsed.

The Emergency Portacaval Shunt. W. D. O'Sullivan and M. A. Payne. Surg. Gynec. & Obst. 102:668-676 (June) 1956 [Chicago].

The authors, realizing that nonsurgical measures were largely ineffective in the emergency treatment of bleeding from esophageal varices, and also impressed with the magnitude of palliative and temporary surgical measures, considered it proper to perform a portacaval shunt in the treatment of actively bleeding cirrhotic patients. They subjected nine patients to emergency portacaval shunts. In each instance temporary hemostasis had been achieved by the use of the Sengstaken-Blakemore balloon. Seven of these nine patients had ascites, six had jaundice (serum bilirubin level over 3 mg. per 100 cc.), and six had been in coma prior to operation. Three patients died postoperatively, one of hepatic renal failure five days after operation, and one a month postoperatively of hepatic failure and hepatic vein obstruction. The third died of persistent hemorrhage with a thrombosed portacaval anastomosis. Of the six who survived operation, three died later. In two of these three deaths homologous serum was thought to play a major role. One man died of homologous serum jaundice 4 months postoperatively; another survived an attack of homologous serum jaundice and died of hepatic failure 18 months after operation; and the third lived 3 years and 5 months after portacaval shunt before dying of hepatic failure. The remaining three patients were well when last seen. There was no recurrence of esophageal hemorrhage in those who survived operation.

In evaluating their surgical results the authors emphasized the salvage rate rather than the surgical mortality, because they considered it unlikely that a higher survival rate would have been achieved without, or with only a limited, surgical treatment. The immediate survival of six of the nine desperately ill cirrhotic patients is satisfactory. With their current plan of management by prompt performance of a portacaval shunt when the hemorrhage necessitates esophageal tamponade, they hope to prevent the deterioration that follows unsuccessful expectant treatment. Improvement in the mortality is expected from earlier operation. They believe that portacaval shunt should be considered as an emergency measure for the control of esophageal hemorrhage.

Recurrent Varicose Veins. K. A. Lofgren, T. T. Myers and W. D. Webb Jr. Surg. Gynec. & Obst. 102:729-736 (June) 1956 [Chicago].

The factors involved in the recurrence or persistence of varices in the lower extremity, after treatment by ligation (usually including resection) and injection, were investigated in 341 patients who underwent 510 operations for recurrent varices. All previous operations had consisted of ligation followed by sclerosing therapy except that two patients had undergone incomplete stripping procedures. Recurrent varices of the great saphenous vein were present in 96% of the patients and of the small saphenous vein in 4%. Whereas the ligations had been inadequate in 61% of the 510 extremities and adequate in 39%, incompetent superficial veins remained in the thigh, leg, and foot in all and incompetent perforators in many of the patients. The authors list the following as the essentials of adequate surgical treatment of varicose veins: (1) adequate ligation above at the saphenofemoral or saphenopopliteal junctures, (2) thorough removal of all incompetent superficial veins below, down to the dorsum, or lateral aspects of the foot, by stripping and dissection, and (3) individual ligation and resection of all incompetent perforators present. Thorough eradication of all the incompetent veins is the most effective preventive measure against recurrence. To ensure that a satisfactory result is maintained, periodic follow-up examinations are necessary.

The Effect of Methionine on the Production of Mucopolysaccharides and Collagen in Healing Wounds of Protein-Depleted Animals. K. N. Udupa, J. F. Woessner and J. E. Dunphy. Surg. Gynec. & Obst. 102:639-645 (June) 1956 [Chicago].

The studies described demonstrate that if rats are maintained on a protein-poor diet, wound-healing is retarded. There seem to be two major factors in this impairment of wound repair, a decreased accumulation of mucopolysaccharides and retarded collagen synthesis. The authors found that, when methionine was added to the protein-poor diet, the accumulation of mucopolysaccharides and the formation of new collagen fibers were restored to nearly normal levels.

Observations on Patient Tolerance with Intravenous Administration of Fat Emulsion. P. H. Jordan Jr., P. Wilson and J. Stuart. Surg. Gynec. & Obst. 102:737-747 (June) 1956 [Chicago].

This paper descibes experiences with 633 infusions of a new fat emulsion in 209 men. Each of the 15 lots of fat emulsion used contained 10% w/v sesame oil, U. S. P., 4.5% w/v dextrose, U. S. P., and 0.65 w/v soybean phosphatides. The emulsion was homogenized under high pressure, collected in vacuum bottles, and sterilized by autoclaving. Each lot was subjected to extensive testing by the manufacturer to meet rigid specifications pertaining to composition, particle size, sterility, thermogenicity, toxicity, antigenicity, vasomotor activity, and compatibility with human plasma. Age of the emulsion at the time of administration varied from 1 to 5.2 months. Most of the 209 patients were given infusions of fat emulsion because of their need for supplemental caloric intake either because of chronic malnutrition or because of inadequate postoperative nutrition. The remaining patients, hospitalized for minor operations, were volunteers who did not represent nutritional problems. In general, each patient received an initial test infusion of 500 ml. If tolerance was satisfactory, the infusion was continued to a total of 1,000 ml. If the patient reacted unfavorably, the infusion was discontinued and repeated on a second day. If the patient's response was unfavorable on the second day, no further administrations were attempted. Rate of administration averaged 235 ml. (23.5 gm. of fat) per hour for four hours but was varied according to the patient's tolerance.

Excluding temperature changes, 62% of the infusions were without any untoward effects, and 6% were discontinued because of side-effects. With regard to time of onset, the side-effects fell into three groups. Back pain, flushing, chest pain, and dyspnea, if observed, usually occurred after administration of a few milliliters of emulsion. Chills and associated pyrexia did not occur before the administration of 100 to 300 ml. of emulsion. Headache, nausea, vomiting, arthralgia, and blurring of vision rarely occurred before 500 ml. was given. Reactions were most frequent in patients with hepatic dysfunction. About

70% of all administrations of fat emulsion were accompanied by an elevation in the patient's temperature. It was calculated that the energy lost as the result of temperature elevation averaged 4 to 8% of the calories given. The authors believe that such losses are not important. The marked variability of tolerance to fat emulsion manifested by different patients and by the same patient on different occasions suggests that reactions are due to unknown physiological factors within the patient as well as to the structure and composition of the fat emulsion. Intravenous fat emulsion should be withheld from patients with adrenal insufficiency or severe hepatic or cardiovascular disease. Fat emulsion can be given intravenously with safety and benefit to many patients who must depend entirely on parenteral alimentation for nutrition.

Group Training of Patients with Injuries of Upper Extremities. B. Eskesen. Ugesk. læger 118:372-376 (April 19) 1956 (In Danish) [Copenhagen, Denmark].

Patients with trauma of the upper extremities, especially fractures, are treated in the outpatient department of the Copenhagen Municipal Hospital with group training and active exercises. The importance of early mobilization and prophylaxis against post-traumatic dystrophy and for more rapid rehabilitation of the patients is stressed. Group training stimulates the patients and leads to greater intensity in training. The treatment is usually continued for from four to six weeks. In the severest cases treatment has been given for from five to six months. Neuroses cause decreasing activity in some patients and delay the return to full working capacity. In more gravely ill patients with developed neuroses, psychiatric treatment is necessary. Since 1950, 300 to 350 patients with injuries of the upper extremities have participated in the group training. Although there was beginning dystrophy in some cases, almost all the patients have become able to work.

NEUROLOGY & PSYCHIATRY

Deep Hypothermia in Intracranial Surgery. N. Lundberg, K. C. Nielsen and E. Nilsson. J. Neurosurg. 13:235-247 (May) 1956 [Springfield, Ill.].

Eighteen patients between the ages of 22 and 68 years, 14 with brain tumors and 4 with aneurysms of the parietal and anterior communicating arteries, respectively, underwent a major intracranial operation with the aid of general hypothermia at the neurosurgical department of the University of Lund, Sweden. The lowest rectal temperature varied between 24.8 C (76.6 F) and 29.2 C (84.6 F). Hypothermia was induced, and body temperature was restored to normal by means of circulating air in a special apparatus called a cold box in which the patient was placed. Active cooling was interrupted when a rectal temperature of about 30 C (86 F) was reached, after an average of 2 hours and 20 minutes. The patient was removed from the box and placed on the operating table, and the operation was started. There were two operative deaths; one was caused by multiple cerebral metastases from a generally metastasizing bronchial cancer, and the other was caused by a diffuse purulent meningoencephalitis of unknown origin. With the exception of bronchopneumonia of moderate severity in one patient, there were no extracerebral complications of any significance. Two postoperative hematomas were evacuated. There were no signs of cerebral complications ascribable to hypothermia. The blood pressure dropped to levels between 40 and 60 mm. Hg in 10 patients and between 60 and 90 mm. Hg in 8 patients. An additional decrease in blood pressure to levels between 30 and 50 mm. Hg was induced with the aid of trimethaphan camphorsulfonate (Arfonad) in two patients with arterial aneurysm. At these blood-pressure levels the conditions with regard to bleeding, hemostasis, and dissection of aneurysms were highly favorable. In the patients with brain tumor, observations during the operations showed that the preoperatively increased intracranial pressure was considerably reduced in the course of deep hypothermia. In none of these patients was any tendency to acute swelling of the brain observed during the operation. Deep hypothermia produces certain favorable effects in intracranial surgery performed on patients with brain tumors and vascular malformations. The method should be used in selected cases in which these effects are of special importance.

Problems in Bleeding Disorders. M. Stefanini. Postgrad. Med. 19:420-433 (May) 1956 [Minneapolis].

Normal hemostasis depends on the integrity of three basic elements: the vascular wall, the platelet, and the coagulation of blood. The presence of a bleeding tendency is usually revealed in a patient's history: reports of spontaneous bleeding will be found in severe cases, while in those that are less severe bleeding will be noted only after major injury or surgical and dental procedures. Laboratory procedures are needed, however, both to confirm the existence of the tendency and to indicate its probable cause, whether vascular defect, platelet deficiency, or coagulation abnormality. The tourniquet test, one of the simplest and most valuable of the screening procedures, supplies information about both platelet sufficiency and vascular integrity. Determinations of the bleeding and clotting times of whole blood are often considered adequate for the detection of patients in whom hemorrhage will occur during surgical procedures, but the inaccuracies to which they are subject make them somewhat unreliable. One-stage determination of the prothrombin time of plasma and serum, or one of the many variations of this test, seems, therefore, to be more convenient, significant, and informative than the determination of the clotting time of whole blood. The prothrombin time tests, which have been greatly simplified by the availability of commercial reagents, not only give a more realistic indication of the over-all coagulability of the blood but also show whether or not the two phases of blood coagulation leading to the formation of thromboplastin and thrombin are normal. Observation of clot retraction, detection of fibrinolysis, and staining of a smear of the peripheral blood for a semiquantitative estimate of the number of platelets and a study of their morphological appearance are procedures that require little time or effort but are very rewarding either as presurgical tests or as means of classifying a patient known to have a bleeding tendency. The correct classification of a patient's hemorrhagic disorder is, of course, the key to its successful treatment. Most hemorrhagic disorders can be controlled if the remedies now available are properly used.

Patients with occult bleeding tendencies, that is, those who do not bleed spontaneously but who will bleed severely during surgical procedures or after trauma, usually have either pseudohemophilia, thrombocytoasthenia, or the hemophilia-like diseases. They, too, can usually be detected by adequate preoperative screening tests. More specialized problems are presented by the hemorrhagic syndromes directly due to surgical procedures and appearing in patients whose hemostatic mechanism was normal before operation. One of these, thrombocytopenia caused by multiple replacement transfusions, is due to platelet deficiency induced by an abundant loss of blood and its replacement with platelet-poor bank blood. Bleeding of this type can easily be controlled by the administration of platelet-rich blood or of prepared platelets. Another, fibrinolytic exsanguination, which may occur during certain operations or in the hemorrhagic crises of obstetric accidents, is due to activation of the fibrinolytic system leading to severe fibrinogenopenia. Liberal administration of fibrinogen (to replace lost protein) and corticotropin (to raise the antifibrinolysin titer) may prove life-saving in patients with bleeding of this type. Finally, patients with polycythemia are also potentially serious bleeders and should be given careful preparation before being subjected to surgical procedures. Various aspecific medicaments, such as the flavonoids, semicarbazones and alpha-naphthylamine derivatives, and toluidine blue have been advocated for the control of bleeding. Experience shows that the flavonoids offer some help in the treatment of vascular purpura and that toluidine blue is of some help in certain specific bleeding disorders; the semicarbazones and alpha-naphthylamine derivatives, however, have little or no value.

Results of Five-Year Penicillin Therapy in Patients with Neurosyphilis. T. Orban and L. Lazarovits. Wien. med. Wchnschr. 106:377-380 (April 28) 1956 (In German) [Vienna, Austria].

Two hundred fifty-four patients with neurosyphilis associated with a positive cerebrospinal fluid were given a course of 3,000,000 or 4,800,000 units of penicillin. Later on courses of 6,000,000 to 9,000,000 units were given. Sixty-five patients were treated with penicillin combined with fever therapy. Of

the 254 patients, 56 (22%) had the meningovascular type of the disease, 74 (29%) were asymptomatic patients or had isolated pupillary syndromes, 60 (24%) had progressive paralysis, and 64 (25%) had tabes dorsalis. One hundred eighty-seven patients were free from complaints and had few symptoms as a result of early treatment of syphilis with large doses of arsenic and bismuth. Sixty-seven patients had lancinating pains, initial psychic disturbances, pseudoneurasthenia, ataxia, atrophy of the optic nerve, and gastric disturbances. The patients were followed up for five years. Repeated courses of penicillin were given to those in whom the cerebrospinal fluid was restored to normal but later on because positive again and to those in whom the clinical aspect became worse despite improvement of cerebrospinal fluid.

As a result of the penicillin therapy, 16 patients with lancinating pains became free from pain and four were improved. In 14 of 23 patients with psychic disturbances, the condition became stationary. Disturbances of association, capacity for concentration, and physical and psychic fatigue were improved frequently. Pseudoneurasthenia was likewise improved. Nine of 14 patients with ataxia were improved. Of eight patients with atrophy of the optic nerve, five were improved and in three the atrophy did not progress. Gastric disturbances could be prevented for prolonged periods. For continued success of the penicillin therapy, total doses of 6,000,000 to 12,000,000 units of the antibiotic were required for patients with meningovascular neurosyphilis, the asymptomatic patients, and those with isolated pupillary syndrome, while total doses of 12,000,000 to 20,000,000 units were required for patients with tabes. Hospitalization was not required. Penicillin therapy was highly successful in patients with meningovascular syphilis, obviating the need for fever therapy. In the asymptomatic patients or in those with isolated pupillary syndrome, fever therapy was resorted to only when after the administration of at least 20,000,000 units of penicillin the cerebrospinal fluid did not improve, became worse, or when it became positive again after having been restored to normal. In many patients with tabes dorsalis improvement could be obtained with penicillin alone, obviating the need for fever therapy. The cerebrospinal fluid was restored to normal and symptoms were improved. Combined treatment with penicillin and fever therapy was required for patients with advanced atrophy of the optic nerve and for some patients with progressive paralysis and tabes dorsalis.

Exogenic Factors Contributing to the Pathogenesis of Poliomyelitic Paralysis. B. Weber. Deutsche med. Wchnschr. **81**: 740-742 (May 11) 1956 (In German) [Stuttgart, Germany].

Of the 265 patients with poliomyelitis who were reported in the course of the epidemic of poliomyelitis in Dortmund, Germany, in 1952, 12 died, a mortality rate of 4.5%. Of the 253 patients who survived, 113 did not have paralysis and 140 had paralysis or paresis. A follow-up one year after the onset of the disease showed that 153 patients no longer had any paralysis or paresis, while of the remaining 100, 46 had mild forms and 54 severe forms of paralysis. One hundred thirteen pareses were still observed in the patients' legs as compared with 172 at the onset of the disease. The number of pareses in the arms at the onset of the disease was 52, and that observed one year later was 31. These numbers were not statistically significant, and the upper extremities were therefore excluded from the author's study. It appears noteworthy that certain muscles of the lower extremities were much more frequently affected than others. The most frequently affected muscles were the quadriceps, the tibialis anterior, and the iliopsoas. These are the muscles needed for locomotion. The muscles concerned with walking were two times more often affected than those concerned with standing. Attention is called to the fact that untrained persons with so-called muscle hangover first have pain adjacent to the tibia. It does not seem unlikely that processes similar to those that elicit the muscle hangover may occur in the anterior column of the spinal cord and may contribute to the paralysis. It may depend on functional peculiarities, and exogenous factors may play their part in its manifestation.

The history of 29 patients revealed a peculiar occurrence, i. e. trauma in 9; athletic strain in 7; and a febrile disease such as pertussis, pneumonia, or measles in 7; poliomyelitic paralysis occurred shortly after tonsillectomy in 2 patients, after laparotomy in 2 others, and after the patient's return from a strenuous trip in 2 others. Although these 29 patients suffered exogenic damage before the onset of poliomyelitis, a definite cause and effect relationship was not proved. It may be assumed that these factors contributed to the causation of paralysis by causing an unusual increase in performance. This, rather than the usual performance, no matter how strenuous, predisposes the patient with poliomyelitis to pareses. Thus, the study of functional peculiarities of the individual muscles and their behavior in poliomyelitis offers an opportunity for an objective study of the antecedent conditions necessary for the occurence of paralysis. Mechanical factors are not the only ones that may predispose to the disease, but one may assume that they favor the occurrence of paralysis.

Prognosis After Survival from Meningitis Due to Pfeiffer Bacillus. C. Mose. Ugesk. læger **118**:411-412 (April 26) 1956 (In Danish) [Copenhagen, Denmark].

Of the 31 patients with bacteriologically verified meningitis from the Pfeiffer bacillus treated from 1932 to 1954, 21 were given streptomycin. Twenty of these patients survived the acute phase; one patient died after four months from hydrocephalus caused by the meningitis. Of the 10 patients not treated with streptomycin, only one patient survived. The 20 remaining patients were followed up for an average of three and a half years after the meningitis. Five had no sequels of any kind, and 12 had slight sequels—transient or still persisting slight irritability and nervousness, slight paralysis of abducens, bilateral positive Babinski signs, or transient disturbances in the sense of balance. One patient had had difficulty in walking for half a year after the disease. In two cases marked symptoms were present not attributable to the meningitis. The psychic disturbances observed at follow-up are ascribed to the purulent meningitis, and the disturbances in the sense of balance, to the streptomycin. The large doses of streptomycin applied when the substance came into use were reduced later. No symptoms of graver injury to the eighth cranial nerve were seen.

Disseminated Sclerosis: Etiology, Pathology, and Pathogenesis. O. Gröntoft. Nord. med. **55**:613-616 (May 3) 1956 (In Swedish) [Stockholm, Sweden].

The geographic localization of disseminated sclerosis is closely related to latitude: the disease occurs frequently in northern latitudes, with decreasing frequency toward the equator. It does not seem to be a deficiency disease. While it is not hereditary in the usual sense, hereditary factors are believed to play a certain role as predisposing factors. In about 90% of the cases disseminated sclerosis progresses with characteristic attacks and remissions. The condition tends to be aggravated after each attack. In about 10% of the cases, mostly in patients aged between 40 and 50, the disease progresses rapidly and may lead to death after some months. The average duration of life after the onset of the symptoms is estimated to be at least 20 years (Lumsden). The pathoanatomic picture is marked by multiple, usually well-defined patches, varying in diameter from a couple of millimeters to several centimeters. The patches, widely spread over cerebrum and spinal cord, are characterized by myelin loss without axon degeneration. The tissue reaction around the patches is of a glial kind. The different clinical symptoms are explained by the localization of the patches. The histopathological picture leaves no convincing explanation of the pathogenesis. The histological picture agrees more with a toxic degeneration than with an inflammation. In the main, the clinical and pathological anatomy and a number of etiological factors are known. The problem of pathogenesis and therapy continues unsolved.

Carbon Dioxide Therapy in Psychiatric Patients. G. W. Hopkins. Mil. Medicine **118**:497-501 (May) 1956 [Washington, D. C.].

After reviewing the history and discussing some theoretical aspects of carbon dioxide therapy, Hopkins describes various methods of administration, pointing out that in the 215 patients studied a modification of Meduna's method was used. Favorable results were obtained in 35% of those with psychoneuroses, 63% of those with psychophysiological disorders, 35% of those with personality disorders, and none of those with psychoses.

Six of 10 patients with unqualified anxiety reactions showed a favorable response to the treatment, while only 30% of a larger group of patients with qualified anxiety reactions responded favorably. Only 24.9% of patients who did not become unconscious during the treatment responded favorably, whereas 49.6% of those who became unconscious during the treatments showed a favorable response. Only 20% of the patients who became unconscious during the treatment but did not dream responded favorably, while 61% of those who became unconscious, and in addition dreamed while unconscious, showed a favorable response. The more favorable response in patients who dream while under treatment may be due to the fact that the remembered dream material becomes available for the patient to deal with consciously accompanied by abreaction. It may also be due to the fact that remembered dream material is often used in subsequent psychotherapeutic interviews. Carbon dioxide treatment is contraindicated in patients with severe hypertension, active pulmonary tuberculosis, cardiovascular disease including coronary heart disease, acute allergic respiratory reactions, and advanced emphysema. Psychiatric contraindications include prepsychotic states, as these conditions have been found to develop into frank psychoses as a result of carbon dioxide treatments.

Virus Encephalitis: A Clinical Study of 106 Cases. K. N. Gour. J. Indian M. A. 26:384-388 (May 16) 1956 (In English) [Calcutta, India].

In the course of 1954, 65 male and 41 female patients with virus encephalitis were admitted to the hospital in Agra, India. No age group was exempt from the disease, but two-thirds of the patients were less than 10 years old. The incidence of the disease was highest in August and September, amounting to a mild epidemic after a period of drought and a long spell of hot weather. A recrudescence occurred in the month of November. The patients belonged to the poorer or middle class families living in unhygienic conditions. The cases were classified into three types depending on the onset and severity of the signs and symptoms. Fulminating cases were those with a sudden onset, high temperature of 105 or 106 F (40.6 to 41.1 C), vomiting, convulsions, restlessness, mental apathy, coma, and death within a few hours. Severe cases were those with a fairly sudden onset, temperature of 102 or 104 F (38.9 or 40 C), headache, vomiting, restlessness, and mild delirium. Mild cases were those in which the initial symptoms consisted of slight rise in temperature, headache, occasional vomiting, and listlessness. Thirty-eight patients died, a mortality rate of 36%. Twenty-four of these died within 12 hours of admission before they had received an adequate dose of antibiotics. Tetracycline was given to 45 patients, oxytetracycline (Terramycin) to 32, and chlortetracycline (Aureomycin) to 10. Tetracycline gave the best results. The disease was not contagious; not more than one patient belonged to the same family and in none of the physicians, nurses or attendants did any signs of the disease develop. Laboratory studies revealed a polymorphonuclear leukocytosis in 53 patients and a lymphocytosis in 14. Reactions to Widal's test, which was performed in a few patients, were negative. The routine and cultural studies of blood, urine, and throat swabs, and stool examinations gave negative results. The cerebrospinal fluid was under tension in most patients; it was clear and there was an increase in cells and proteins were increased, but the chlorides were unaffected. Culture of the cerebrospinal fluid was negative. A virus was considered to be the causative agent, and it was suggested that it should be designated Northern India encephalitis virus.

GYNECOLOGY & OBSTETRICS

Foetal Mortality in Pregnant Diabetics: Strict Control of Diabetes with Conservative Obstetric Management. J. Pedersen and E. Brandstrup. Lancet 1:607-610 (May 5) 1956 [London, England].

Not until after 1940 was it generally known that the fetal mortality in diabetes was still very high (about 40%) and not much different from the mortality in the preinsulin era, in contrast to the prognosis for the mothers, which became good after the advent of insulin. In January, 1946, at the maternity department of the Rigshospitalet in Copenhagen, a clinical trial of strict control of the diabetes and conservative obstetric management was started. By the end of September, 1955, a series of 265 diabetic pregnant women had been treated in this way and the results compared with those observed in 157 diabetic pregnant women treated at the same hospital from 1926 to 1945. In the trial group, the mother was examined every three weeks during the first four months of pregnancy and then weekly. About eight weeks before the expected term she was admitted to the hospital. The aim was to obtain the best possible chemical control of diabetes by giving a measured diet and insulin. The diet contained about 1,900 calories, 80 to 90 gm. of protein, 175 to 200 gm. of carbohydrate, about 80 gm. of fat, and supplementary vitamins, calcium, and iron. The blood sugar level was controlled by alternation of the insulin dosage and distribution of the caloric intake over five or six meals, according to individual requirements. To combat toxemia, hydramnios, and edema, table salt was restricted. Phenobarbital was given to some patients, and abdominal amniotomy was tried in a few; but no hormones, mercurial preparations, ammonium chloride, rutin, or similar substances were used.

Pregnancy was usually terminated at the beginning of the 38th week, on the average 20 days before the calculated term. Nearly all deliveries were induced with drugs and/or by rupture of the membranes. Only 29 cesarean sections (11%) were done on obstetric indications, whereas low-forceps deliveries were common. In about 20% of the patients labor started spontaneously. The newborn babies were placed in incubators and given oxygen, warmth, and humidity for the first 24 hours. During this period the babies were not fed. The authors differentiate between those receiving long-term and short-term treatment, depending on the stage of pregnancy at which the woman first applied for treatment at the clinic. In 130 women who received long-term treatment the fetal mortality was reduced to 10%, whereas in the 135 receiving short-term treatment it was 33%, and in the 157 women treated between 1926 and 1945 it was 38%. The total fetal mortality in the 265 cases steadily decreased but varied according to the proportion of patients receiving long-term or short-term treatment. The authors believe that the lowest fetal mortality possible in diabetes is about 6%. Intense medical treatment and expert obstetric care is necessary to achieve this. Their treatment is prophylactic, making the babies more like normal babies, especially as regards neonatal blood sugar level, weight, length, volume of liquor amnii, and fetal mortality.

Repercussions of Fetal Anoxia on the Central Nervous System. A. Minkowski and S. Sainte-Anne-Dargassies. Rev. franç. études clin. et biol. 1:531-553 (May) 1956 (In French) [Paris, France].

The oxygen content and oxygen capacity of blood from the umbilical vein or cord of 207 babies was measured before they cried for the first time. Anoxia was defined as a saturation of less than 50%. There clearly was a correlation between the degree of fetal anoxia and the neurological condition of the newborn infants, who were classified as normal, slightly abnormal, or frankly pathological. Careful neurological examination was performed on each one; this allows of assessing the degree of cerebral involvement and sometimes of determining a prognosis. Electroencephalographic findings tend to be more related to the clinical manifestations than to the degree of anoxia.

Postmaturity causes fetal anoxia, even in the absence of obstetric trauma, in one out of three prolonged pregnancies. It appears that the placenta becomes less permeable to oxygen once term is past. Women who carry their babies past term should be carefully watched for signs of fetal suffering. In a multipara with a history of previous prolonged pregnancies and harm to the offspring, labor should be induced without delay, probably before the traditional post-term two weeks are up. The same policy should be pursued when there is an additional possible cause of fetal anoxia, such as toxemia of pregnancy, diabetes, or circumstances leading to dystocia. The case of every primipara with prolonged pregnancy must be judged individually; labor should not be induced until after the two-week period unless there are indications to the contrary. Some of the latter are slowing of the fetal heart beat, cessation of movement on the part of the fetus, and a stained amniotic fluid as revealed by puncture with aspiration.

Use of Phenothiazine Derivatives for Obstetric Anesthesia. K. W. König. Medizinische, No. 19, pp. 727-729 (May 12) 1956 (In German) [Stuttgart, Germany].

Of 199 parturient women, 124 were given a single injection of 50 mg. of promethazine combined with 50 mg. of Megaphen (another phenothiazine derivative of even greater potency) and with 100 mg. of meperidine hydrochloride. Eighty-six of the 124 women were primiparas and 38 were multiparas. Nine of the 124 women were given a second identical injection, and one received a third injection. The remaining 75 women, 42 primiparas and 33 multiparas, were given a course of injections; the first one consisted of 50 mg. of Megaphen and 50 mg. of promethazine, and successive injections of 12.5 mg. of Megaphen were given at two-hour intervals. The phenothiazine derivatives were given when the external os was dilated to 4 cm. in primiparas and 2 cm. in multiparas. The hypnotic and analgesic effect of the injection lasted about four hours and occasionally up to eight hours. The duration of the hypnotic effect was longer than that of the analgesic effect. The phenothiazine derivatives should not be given too late, so that the patients are able again to play an active part during the expulsion period. The combination of promethazine, Megaphen, and meperidine was superior to that of promethazine and Megaphen with regard to both the hypnotic and the analgesic effect. A third combination, i. e., promethazine, Megaphen, and scopolamine was used in five women only. In three of the five patients scopolamine caused pronounced agitation that was not attenuated by Megaphen. The further use of this combination does not seem to be justified. Combined administration of promethazine, Megaphen, and meperidine reduced somewhat the activity of labor pains and thus caused a certain prolongation of the first stage of labor, but other undesirable side-effects were not observed. The incidence of deliveries by forceps was not increased. The effect on the blood pressure of the parturient women varied, but a hypotonic effect was observed in only a few patients. A damaging effect of the drug on the infants was not observed. The phenothiazine derivatives are indicated for obstetric anethesia, and they exert a favorable influence on the delivery, particularly on that of long duration associated with severe pain and with spasms of the external os.

Cortisone in the Treatment of Infertility. R. B. Greenblatt, W. E. Barfield and C. P. Lampros. Fertil. & Steril. 7:203-212 (May-June) 1956 [New York].

Thirty-seven women between the ages of 17 and 39 years with amenorrhea or other menstrual disorders were treated with cortisone. Many of them were considered to have mild adrenogenitalism because of moderately raised urinary 17-ketosteroid excretion and mild to severe hirsutism. Others were thought to have a typical Stein-Leventhal syndrome; in these patients, enlarged ovaries were shown by x-ray or palpation. Thirty-two of the patients were married, and 28 of these complained of sterility or relative infertility. The cortisone dose was adjusted to the level considered best for each patient and varied from 25 to 100 mg. of cortisone given orally daily. Most of the patients were given a daily dose of 50 mg. Later in the study 20 mg. of hydrocortisone was given two or three times daily to some patients. In a few patients treatment was started with an intramuscular injection of 100 mg. of cortisone or hydrocortisone, and in several patients 6 to 10 pellets of 100 mg. each of cortisone were implanted; 32.4 mg. of thyroid extract daily was given routinely to counterbalance any hypothyroidism that might be produced by the cortisone, and 3.24 gm. of potassium chloride three times daily was added to compensate for excessive urinary excretion of this electrolyte. Patients were advised to remain on a high-protein, low-carbohydrate, low-fat, and low-salt diet. Ten patients became pregnant during cortisone therapy or after therapy was discontinued. Five women had ovarian wedge resection because of failure to respond satisfactorily to cortisone therapy, and three of these conceived. There was a total of 15 pregnancies, 4 of which ended in abortion. Infertile women with amenorrhea, anovulatory menses, or other menstrual disorders, especially when these are complicated by varying degrees of hirsutism, should have the benefit of a three-to-six-month trial course of cortisone before being subjected to wedge resection of the ovaries or irradiation therapy. An increased level of urinary 17-ketosteroids is a good but not a necessary indication for cortisone therapy. Of the 13 women who became pregnant, 5 had increase 17-ketosteroid levels, 4 had a borderline increase, and 4 had values within the normal limits of 7 to 13 mg. per 24 hours. As a rule, low-normal values of 11-oxycorticoids or 17-hydroxycorticoids were observed. Hirsutism is not a necessary prerequisite for cortisone therapy in patients with ovulatory disorders.

PEDIATRICS

Radiological Complications of Primary Pulmonary Complex in Course of Isoniazid Treatment. R. Matte and R. Cabrera. Rev. chilena ped. 27:1-4 (Jan.) 1956 (In Spanish) [Santiago, Chile].

Nine children between the ages of 1 and 9 years with primary pulmonary tuberculosis were given isoniazid alone or combined with streptomycin and/or PAS. Isoniazid was given in average daily doses of 6.6 mg. per kilogram of body weight up to an average total dose of 7.8 gm. in a period of three weeks to five months. The clinical results were satisfactory in all patients. Early in the course of treatment the appetite and the general condition of the patients improved and they gained weight. The roentgenograms of the lung showed an initial increase in the size of the lesions, but later a marked clearing occurred under treatment. The sedimentation rate decreased in seven patients and increased in two. The radiological complications showed no correlation with the clinical results. The authors conclude that the complicating roentgenographic shadows in patients treated with isoniazid have neither pathological significance nor prognostic value and that they are transient.

Studies on Perinatal Mortality: Analysis of Conditions in Copenhagen 1949-1953. T. Kærn. Bibl. læger 147:1-42 (No. 1) 1955 (In Danish) [Copenhagen, Denmark].

As a result of recent studies on anoxia in perinatal deaths and later brain injuries, the hypothesis is set up that a number of pathological conditions during pregnancy lead to a decrease in the oxygen reserve in the fetus and that influences during and after birth that would not otherwise be harmful are poorly tolerated. The anoxemia may be acute, insidious, or intermittent. From 1949 to 1953 there were in Copenhagen 1,830 perinatal deaths in 56,560 births. In 1,525 cases anoxemia is believed to have been the actual cause of death. In about one-half of the cases, pathological conditions in pregnancy are assumed to have affected the oxygen metabolism of the fetus. Among general diseases diabetes, hepatitis, and anemia are especially noteworthy. In 14% of the cases hemorrhage occurred during pregnancy, and grave toxicosis was found in 6%, with a corresponding number of mild toxicoses. Postmaturity is considered significant after the 43rd week. In 12% of the cases abnormalities in placenta or umbilical cord were present. Factors believed to cause an extra handicap at birth are 1) atypical position of the fetus and pathological course of delivery, 2) intervention at birth, and 3) medicaments at birth. The position of the fetus was atypical in 30% of the cases. The course of delivery was pathological in fully one-third of the cases. Intervention at birth occurred in 20%. Morphine preparations, in the extent in which they are applied in Denmark, hardly affect infant mortality, but pituitrin medication may have been a contributing cause of death in some cases. Cerebral hemorrhage is regarded as the cause of death in 5% of the cases and malformations in 9%. Rhesus immunization led to perinatal death in only 36 cases.

Current Results in Treatment of Tuberculous Meningitis and Miliary Tuberculosis. J. Lorber. Brit. M. J. 1:1009-1011 (May 5) 1956 [London, England].

In 1954, 20 new patients were admitted to the Children's Hospital, Sheffield, England, with tuberculous meningitis. Five had associated miliary tuberculosis. One of the 20 patients, a 3-year-old girl, died. She had been in status epilepticus on admission and never recovered consciousness. In the treatment of this group, a reduction in the number of intrathecal injections of streptomycin to a minimum of 25 and an average of 32 did not result in poorer results than were obtained in patients treated

previously, and the spinal fluid findings returned to normal as rapidly as before. Only one of the survivors has serious neurological and mental sequelae. The author believes it would be unwise to abandon intrathecal treatment because tubercle bacilli may reappear in the spinal fluid after a course of intrathecal treatment during isoniazid therapy. Cortisone was not given to any patient.

Of 69 consecutive patients admitted with tuberculous meningitis during 1952 to 1954 inclusive, 59 survived, and, of the 59 who were conscious on admission, 54 survived. The 11 with uncomplicated miliary tuberculosis admitted during this period also survived. None had meningitis during or after treatment with isoniazid and streptomycin.

DERMATOLOGY

Occupational Eczema from Chlorpromazine. G. Høvding. Tidsskr. norske lægefor. 76:250-251 (April 15) 1956 (In Norwegian) [Oslo, Norway].

In hospitals where chlorpromazine is extensively used, allergy on exposure to the chemical, leading to contact eczema, should not be underrated. Professional steps to reduce the hazard of contact are the only means of hindering the possibilities of sensitization. Prophylaxis must first of all aim at informing the nursing personnel of the danger to those who handle the drug. Injection preparations should be used as little as possible and ampuls substituted as far as possible. Instruments used for injection of chlorpromazine should not be used for other purposes. In sterilizing the instruments the lid should not be removed from the container until the water has cooled, to prevent escape of steam containing chlorpromazine. Gloves should be worn on opening the ampuls, on preparing and injecting the solution, and in cleaning the instruments. Chlorpromazine tablets should be given whole. Work with chlorpromazine should be assigned to a definite personnel.

Topical Hydrocortisone Therapy in Diseases of the Skin: A Clinical Evaluation. I. M. Wartzki and B. R. Entwisle. M. J. Australia 1:318-326 (Feb. 25) 1956 [Sidney, Australia].

The authors analyze observations on 100 patients with various types of skin lesions who were treated with local applications of hydrocortisone ointment. The lesions are grouped into nine different dermatoses, the designations used being for simplicity in understanding the diseases under discussion and not with attention to the finer and controversial points in dermatological nomenclature. In certain dermatoses response seems to vary at different sites. Failure to respond to routine treatment other than the application of hydrocortisone ointment has been used as a criterion in most of the cases instead of deliberately applied controls. Hydrocortisone should not be used indiscriminately, as results are negative or inferior to other methods in many diseases of the skin. It should not be used in the presence of infection of the skin, or at any rate unless it is combined with some anti-infective measure with which it is compatible. The best results were obtained in the treatment of the following conditions: erythema multiforme involving the lips, papular urticaria, dermatitis and eczema of the face, especially the eyelids, eczema of the scrotum, pruritus ani and vulvae, and intertrigo of the genitocrural and gluteal folds. Results were disappointing in Besnier's prurigo, diskoid eczema, and otitis externa. In four patients, two with scrotal eczema and two with pruritus ani and intertrigo of the genitocrural and gluteal folds, the condition was aggravated.

The Clinical Vagaries of the Herpes Virus. R. T. Brain. Brit. M. J. 1:1061-1068 (May 12) 1956 (In English) [London, England].

The clinical vagaries of the herpes virus include common recurrent forms of herpex simplex that may appear on any part of the body and occasionally simulate the sensory root distribution of zoster. Recurrent herpes commonly affects the conjunctiva and cornea. Trigeminal neuralgia may be associated with herpex simplex. Primary herpetic gingivostomatitis usually occurs in children after the seventh month of life and up to the sixth year, with most of the cases occurring before the second year, presumably because these children have no demonstrable specific antibodies. Primary herpetic infection may occur as an acute vulvovaginitis. In primary infections of the mouth, genitals, eye, or skin it is not difficult to recognize the herpetic nature of the lesions, and the general symptoms, even when severe, are rarely alarming, although indicative of a systemic infection. The systemic reaction begins about the fifth to the seventh day, with fever or hypothermia, increasing icterus, lethargy, respiratory distress, vomiting, dyspnea, cyanosis, hemorrhagic tendencies, and the rapid development of circulatory collapse. Cases were collected from the literature that showed that the herpes virus could produce a fatal septicemia or hematogenous hepatitis in infants in the absence of major cutaneous involvement.

The strangest cutaneous manifestation of the herpes virus is seen when is occurs in an area of infected or damaged skin, especially in eczematous skin. Kaposi originally suggested the term of eczema herpetiforme for the disease, which has since been called Kaposi's varicelliform eruption. Thirty-six infants and children with this eruption are reported on. In 30 the virus was isolated, or the typical intranuclear inclusion-bodies were observed in smear preparations from the lesions. The other six patients had no contact with vaccinia, and their lesions were of the herpetic pattern. During the same period only two cases of the vaccinial type were seen. Both were fully confirmed, and vaccinia contracted from the infants developed in their mothers. Of the 36 patients, 24 were between the ages of 5 and 15 months and the others were aged less than 3 years, with the exception of one 9-year-old girl. Four of the 36 patients had a recurrence of Kaposi's varicelliform eruption, and the rarity of recurrences contrasted sharply with the high recurrence rate of simple herpes. The unusual degree of infectivity of the herpes virus accounts for small epidemics of Kaposi's varicelliform eruption and for contact lesions on the hands or forearms of nurses and other attendants. These are in marked contrast to the rarity of contact infections from patients with herpes simplex, especially as its lesions are usually on the lips and cheeks. Contact lesions from patients with Kaposi's varicelliform eruption may be typical herpetic vesicles, bullae, or indurated papules, becoming pustular at their apices before necrosis of the central part forms a deep pock. Such lesions developed in five nurses and a pathologist and were contracted from the patients in the course of the epidemic reported on.

OPHTHALMOLOGY

Prednisone and Prednisolone in Ocular Disease. D. M. Gordon. Am. J. Ophth. 41:593-600 (April) 1956 [Chicago].

Prednisone and prednisolone are comparatively free from the undesirable side-effects of other steroids, and they have proved of value in ophthalmologic conditions as well as in rheumatoid arthritis and many other disorders. Gordon presents experiences with these steroids in 87 patients with uveitis, choroiditis, iritis, conjunctivitis, and several other eye lesions. Prednisone and prednisolone were used topically in ophthalmic suspension and ointment forms. Prednisone acetate and prednisolone free alcohol were available in ophthalmic suspensions of 0.125 to 1.0% concentrations. The 0.25% suspension was considered optimal. Prednisone acetate and prednisolone free alcohol appeared to be equally effective in equivalent concentrations. The latter was slightly more irritating locally. The acetate and alcohol forms were used in ointments of 0.1 to 0.5% strength. The 0.5% strength appeared to be optimal. Both prednisone and prednisolone were also given systemically, often with concomitant topical application of the same drug. Initially, doses as high as 80 mg. per day were given, with rapid decreases as the condition responded. Later, 40 mg. daily became the standard initial dosage in severe conditions and 30 mg. in less severe cases.

Preliminary evaluation indicated that prednisone and prednisolone are clinically superior to cortisone and hydrocortisone when used topically in the eye. Systemically, their effect in ocular conditions is much the same as that of cortisone and hydrocortisone, but smaller doses are required. The incidence of important side-effects was not significantly less than with other steroids. In an addendum the author says that since this report was submitted for publication a series of patients several

times as large as that analyzed here has been treated with prednisone and prednisolone, and the efficacy of these steroids has been confirmed. Experiences with the use of the steroids now covering six years reveal that there is still much misunderstanding and misapprehension concerning the basic rules governing the application of steroid therapy in ophthalmology. The indications for the use of hormonal-steroid therapy are edema and inflammation, regardless of cause. The known contraindication is dendritic ulcer (herpes simplex) of the cornea. This should not be confused with herpes zoster, which is an indication. Topical therapy is indicated in all external conditions (those that can be seen with the naked eye) and in most patients with anterior uveitis (iridocyclitis). In the latter condition, it is advisable to shorten the duration and intensity of the disease by the use of systemic hormonal-steroid therapy for the first several days of the acute process, on an ambulatory basis. Topical therapy is valueless when the lesion is located behind the ciliary body (posterior uveitis [choroiditis] and optic neuritis). Here systemic use of the various compounds is mandatory. There is no such thing as a "course" of steroid therapy; the daily dose and duration of treatment are individual and depend on the response of each patient. It is essential to use sufficiently large amounts initially to suppress the disease. An increase in symptoms is a signal to increase the dose, and a decrease in symptoms signals a reduction of the dose. The most common errors are the use of topical therapy when parenteral is demanded and the use of too small doses initially.

Idiopathic Retinal Detachment. A. Hagedoorn and D. H. Sieger. Am. J. Ophth. **41**:660-667 (April) 1956 [Chicago].

In patients with retinal detachment tiny strands may be seen with the ophthalmoscope that are apparently pulling small flaps, even small isolated pieces of the ruptured retina, into the vitreous space. They have been described in pathological specimens as the result of a degenerative or postinflammatory condition of the vitreous body and retina. In some publications, the suggestion may be found that alterations in the retina and vitreous body might secondarily enforce preexisting tiny adhesions to firmer connections, which have a pathogenetic significance in the development of retinal tears. However, as far as the authors know, no histological evidence was given to substantiate these theories. In 1952, one of the authors demonstrated some sections, showing apparent congenital adhesions between retina and vitreous body. The eye in question had been enucleated in a child, aged 9 months, with a diagnosis of pseudoglioma that could not be confirmed by the microscopic examination. A pit in the optic nerve was found. The authors believe that congenital retinovitreal adhesions may play a role in the pathogenesis of retinal detachment; they may explain cases of "idiopathic" detachment; and they may be involved in the pathogenetic process resulting in the formation of strands associated with the formation of flaps and opercula in other cases of retinal detachment.

INDUSTRIAL MEDICINE

Bone and Joint Lesions in Caisson Disease. G. Liess. Fortschr. Geb. Röntgenstrahlen. **84**:472-477 (April) 1956 (In German) [Stuttgart, Germany].

The author suspected caisson disease on the basis of roentgenograms of the shoulder joints brought to him by a patient who complained of rending or tearing pains, particularly in the shoulder joints. The occupational history of this patient, however, at first failed to disclose that he had worked in caissons. Repeated questioning finally revealed that in 1934 and 1935 he had worked in bridge construction and that once after too rapid decompression he had experienced severe pains in the shoulder and knee joints, so that he had to go back into the compression chamber. His complaints of rending pains in shoulder and knee joints dated from 1936. On the basis of roentgenograms of the shoulder and knee joints and of the distal portion of the left femur, the author suggests that the diaphysial foci in humeri and femurs are infarcts, the shell-like walls of which had become visible as the result of impregnation with hydroxyl-apatite. The irregularly striped and spotted opacities and the spots of lesser density in the proximal metaphysis of the right humerus and of the metaphyses of femurs and tibia are probably not all calcified infarcts; some may represent mild trophic disturbances of the bone with subsequent resorptive and osteoplastic proliferative processes of bone transformation. It cannot be ascertained whether the causal trophic disturbances were caused by pressure of the liberated gas bubbles on the tissues or by the obstruction of blood vessels by gas emboli. The changes in the proximal epiphysis of the right humerus seem to be a result of gas emboli in the subchondral terminal vessels. The dense sclerosis in this region seems to indicate a predominantly osteoplastic transformation of bone, which renders the bone structure mechanically so defective that even relatively mild exertion at the shoulder joint will cause fractures.

Vanadium Poisoning in Industry. D. L. Gordon Thomas and K. Stiebris. M. J. Australia **1**:607-609 (April 14) 1956 [Sidney, Australia].

The authors present data on 14 patients with vanadium poisoning who were reported to the industrial hygiene division of the Department of Health of Victoria, Australia, in a period of 10 days. The first patient had cleaned an oil-burning boiler. During the five-hour task a frontal headache developed and later a dry cough and colicky abdominal pains. After 16 hours the patient complained of itching all over the body, swelling of the lips, and smarting of the eyes. On examination, the breath sounds were bronchovesicular with an expiratory wheeze and numerous sibilant rhonchi. Conjunctivitis was present, and examination of the skin disclosed a generalized urticarial rash. With symptomatic treatment the rash and the skin irritation disappeared within 24 hours. The bronchospasm gradually disappeared within one week. A second group of 10 men also had been cleaning out an oil-fired furnace, and the third group had been working about ovens heated by oil fires. Protective clothing and an efficient dust mask should be supplied to men employed in cleaning oil-fired boilers. Vanadium is found in all fuel oil, particularly in the residual heavy oil. It appears as the pentoxide after combustion. The boilers are usually cleaned by chipping the pipes and using air hoses. Bricklayers relining the combustion chambers are also exposed to the dust. Sulfur compounds present may further increase the severity of symptoms. Poisoning is characterized by irritation of the nasopharyngeal mucosa and conjunctivas, with greenish black discoloring of the tongue, anemia, dry cough, rhinorrhexia, recurrent hemoptyses, digestive and renal disturbances, nervous manifestations, trembling, headaches, psychic derangement, and even blindness. The authors describe a modified colorimetric method for the determination of microscopic amounts of vanadium in urine and in the dust of oil-fired boilers. The method is based on the development of a magenta-black color, with vanadium and 8-hydroxy-quinoline in an alcohol-free chloroform medium. This chemical analysis demonstrated the presence of vanadium in the dust to which the men were exposed and also in the urine of some of them.

Plumbism and the Colopathic Syndrome. A. Pendini and C. P. Odaleschi. Gior. clin. med. **37**:241-258 (Feb.) 1956 (In Italian) [Bologna, Italy].

The authors studied the colopathic syndrome in 25 patients with plumbism. Eleven patients had colic only once. Four had them two or three times. These four patients had had appendicostomies, two after one year of work, one after 10 years, and one after 22 years of exposure to lead. According to some authors, recurrent appendicitis is frequent among patients with plumbism. Hypochromia was present in all patients. The number of red blood cells with granular basophilic degeneration was high. Porphyruria had increased in almost all patients. The renal function was normal in only 16 patients. Three showed a slight decrease in the power of concentration or dilution. The blood pressure was normal. Some hyperchlorhydria was present in eight patients. Roentgenoscopy showed acceleration in the passage of the motor test meal through the gastrointestinal tract. Signs of spastic or hypertonic colitis were present in all patients. Duodenal ulcer was present in one, but the authors doubt that it had anything to do with the patient's plumbism. The age of the patient and the length of the exposure showed no relation to the frequency with which the colopathic syn-

drome occurs. Frequency of colic and the whole syndrome are independent of the spastic colitis caused by plumbism. Anemia and porphyruria are not correlated with the degree of intensity of the colopathy. Disturbances of the gastric juices have nothing in common with the syndrome. All the patients showed clinical or roentgenologic evidences of colitis. The authors think that use of alcohol, excessive smoking, poor hygienic habits, poor and unregulated diet, and other bad physical and psychic factors must be considered together with the toxic effect of lead and coproporphyrin to which these patients are exposed during their work.

THERAPEUTICS

A New Drug for Alcoholism Treatment: I. A New Drug for the Treatment of Alcoholism. J. K. W. Ferguson. Canad. M. A. J. **74**:793-795 (May 15) 1956 [Toronto, Canada].

In an attempt to find a drug that, like disulfiram, would render the effect of alcohol unpleasant to the drinker but might be free from some of the disagreeable features of disulfiram that discourage some patients from continuing with its use, several derivatives of carbimide were tested. The syndrome caused by alcohol after use of carbimide is characterized by intense flushing of the face and neck and often of the whole body, accompanied by a rapid pulse, a pounding heart, and panting respiration. Nausea and vomiting sometimes follow, and in more severe reactions a precipitous fall in blood pressure may occur, particularly if the patient attempts to sit up or stand up. The severity of the reaction depends on the amount of carbimide in the system and the amount of alcohol taken. A dose of 50 mg. of calcium carbimide followed in 3 to 15 hours by a test dose of alcohol was found to give rise to sharp reactions on several occasions. When ethanol in doses up to 50 cc. was taken 24 hours after the carbimide, the reaction was very mild. When the dose of calcium carbimide was increased to 100 mg., two persons had definite reactions to test doses of alcohol 30 and 36 hours after taking the carbimide. The action of carbimide persists for only one day, or at the most two days. The effects of disulfiram are known to last for a week or longer. There is also a difference between these drugs in the speed of onset of their sensitizing action to alcohol; all persons tested have been sensitized by a single dose of 50 or 100 mg. of calcium carbimide, while some patients have been known to take 0.5 gm. of disulfiram daily for one week or even two weeks without being sensitized to alcohol. Vaguely unpleasant sensations, which passed off in about one hour and which were attributed to effects of carbimide on the central nervous system when the drug was absorbed too rapidly from the alimentary tract, were avoided when tablets of citrated calcium carbimide were used. Clinical trials of citrated calcium carbimide are now in progress.

A New Drug for Alcoholism Treatment: II. A New Protective Drug in the Treatment of Alcoholism (Preliminary Clinical Trial of Citrated Calcium Carbimide). J. D. Armstrong and H. T. Kerr. Canad. M. A. J. **74**:795-797 (May 15) 1956 [Toronto, Canada].

The unpleasant side-effects, apart from the desired disagreeable reaction to alcoholic beverages, of citrated calcium carbimide (Temposil) were compared with those of disulfiram. Of 19 alcoholic patients, 13 were given citrated calcium carbimide in daily doses of 50 mg. for from 21 days to about four months and 6 received doses of 100 mg. daily for from 6 to 25 days. Seven of the patients had been previously treated with disulfiram and had complaints about some side-effects of that drug such as drowsiness, nausea, impotence, and unpleasant taste. None of the patients who had complained of drowsiness when treated with disulfiram had unpleasant symptoms when treated with citrated calcium carbimide. One patient had a feeling of comfort better than in previous periods of sobriety when taking no drug. One patient with drowsiness and impotence resulting from disulfiram felt more than ordinarily stimulated sexually after taking citrated calcium carbimide. Two patients who had complained of impotence noted no difference when treated with carbimide. The one patient who complained of unpleasant taste while treated with disulfiram did not have this symptom when treated with carbimide. For camparison, 33 alcoholic patients treated with disulfiram were studied. The dose given was 500 mg. daily, and it was reduced to 250 mg. if drowsiness appeared. Two of these patients reported feeling drowsy and nauseated to such an extent that the dose of the drug was reduced to 125 mg. daily. Other complaints were not observed in these patients.

This study suggests that citrated calcium carbimide is useful as one of the group of protective drugs in the treatment of alcoholism. Even if there were no reduction in the incidence of side-effects, citrated calcium carbimide appears to have value as a substitute for disulfiram in patients reporting unpleasant side-effects with the older drug, but it would also appear that there are fewer side-effects with citrated calcium carbimide and that it may be the drug of choice. The results to date are sufficiently encouraging to warrant continued investigation.

A New Drug for Alcoholism Treatment: III. Clinical Trial of Citrated Calcium Carbimide. R. G. Bell. Canad. M. A. J. **74**: 797-798 (May 15) 1956 [Toronto, Canada].

Fifty-one men and 13 women were given 50 mg. of citrated calcium carbimide in a single daily dose. Twenty-six of the 64 patients had previously been treated with disulfiram. Twenty-three patients claimed that they had undesirable side-effects while taking disulfiram, such as drowsiness, weakness, unpleasant taste, unpleasant breath, body odor, or impotence. None of the 64 patients when treated with citrated calcium carbimide complained of such side-effects. Only two stopped taking citrated calcium carbimide because of rheumatoid pain and sore eyes, respectively, which they attributed to the drug. Two patients attempted to drink alcohol 24 to 36 hours after they had received the last dose of citrated calcium carbimide. Both described very unpleasant effects similar to those that would have occurred had they tried to drink after disulfiram medication. Citrated calcium carbimide is less toxic than disulfiram and is much better tolerated by patients as a result. Accordingly, there is real hope that more patients will continue using the drug for the length of time considered important in launching a rehabilitation program. The protection afforded the patient by citrated calcium carbimide is almost instantaneous. If alcohol were taken it is likely that there would be fewer delayed and possibly dangerous reactions with this drug than with disulfiram. Since the new preparation is more rapidly eliminated from the body, it does not provide the carryover of protection for three or four days frequent when disulfiram is withdrawn, but this carryover of protection is of no great significance because patients who discontinue the treatment with disulfiram in order to drink do not change their minds after two to three days without the drug.

RADIOLOGY

Roentgenologic Signs of Chronic Gastritis. K. Setälä and M. Siurala. Acta radiol. **45**:199-211 (March) 1956 (In English) [Stockholm, Sweden].

Roentgenologic and gastroscopic examinations were performed on 401 patients and biopsy specimens were obtained from 302 of them in an attempt to determine whether any common roentgenologic sign may be considered indicative of gastritis and is in agreement with the gastroscopic and/or histological appearance of the mucosal pattern and the anatomicopathological findings in the muscularis mucosae. Results showed that such roentgenologic changes as increased turgor, irregularity, and coarseness of the mucosal folds, when occurring separately, appeared to be relatively unimportant in the diagnosis of gastritis when verified only by gastroscopy. It is true that these changes were observed much more frequently in patients with atrophic gastritis, but only in a certain percentage of the whole series. Hypertrophic and superficial gastritis, however, were suggested at least to some extent by thickening of the folds. Positive correlation of the roentgenologic changes in the mucosal pattern with the histological findings was found more frequently than with the gastroscopic findings in patients with hypertrophic alterations of the gastric

mucosa or in those with signs indicating superficial gastritis, but not in patients with atrophic mucosa. It is evident that the roentgenologic relief pattern not only reflects a functional state but also depends on the pathological condition of the gastric mucosa, particularly the muscularis mucosae, and on the presence of mucasal hyperplasia or superficial inflammation. Although marked roentgenologic signs have a certain significance in the diagnosis of some types of gastritis, roentgen diagnosis can be made only in a few patients. The large and important group of patients with atrophic gastritis does not come within the scope of this diagnostic method. The results of correlation must, therefore, be considered far from satisfactory, and the examination of the stomach with the aid of the barium meal appears to be a rather rough and superficial method.

Observer Error in Serial Radiography. A. H. C. Couch, P. H. Sutton and R. S. Thorpe. Tubercle 37:111-113 (April) 1956 [London, England].

In mass radiography a single reader has been known to miss pathological changes in one-third of the films. This report is concerned with assessing the accuracy of serial radiography. During routine clinic sessions physicians selected 500 pairs of films for examination. Full-size chest films taken on two consecutive attendances of patients with pulmonary disease were chosen. They were selected from patients in whom there seemed to be a reasonable expectation of changing lesions and were classified as better, no change, and worse. The chest radiographs were examined independently by two physicians and a radiologist. The films were assessed as showing no change, improvement, or deterioration. There was agreement in 424 (85%). In 49 (64%) of the 76 cases in which there was initial disagreement, the original opinion of the physician was accepted after discussion of the films. In only 11 instances (2%) was it thought that a physician's incorrect assessment might have delayed or prevented necessary treatment, and only two patients could be said to have suffered in any way, neither seriously.

Facts and Evaluations of Danger of Radiation in War with Strategic Atomic Weapons. L. Kreyberg. Tidssk. norske lægefor. 76:247-250 (April 15) 1956 (In Norwegian) [Oslo, Norway].

Kreyberg concludes that in a future atomic war with full use of the big atomic weapons no measures will be of essential importance in protection. Persons in political and military key positions and small groups of the population can be given temporary relative protection, but numerically these persons will not play any significant part in the future fate of the nation. Irreparable damage will befall such large parts of the world that future life with our present pattern of culture will be impossible. Materially and biologically, large parts of the world will be permanently weakened. The most exposed parts of the world are those where there is concentration of activities and population. The more these truths are admitted, and the sooner the true character of the situation is conceded, privately and officially, the better. A sensible standpoint can then more readily be adopted, both politically and concerning appropriations and efforts for civilian and military defense measures.

The Hazards from the Increasing Use of Ionizing Radiations: A Symposium: I. The Control of Radiological Hazards in the Future Development of Atomic Energy. W. G. Marley. Brit. J. Radiol. 29:261-265 (May) 1956 [London, England].

In many nuclear reactors today there are several millions of curies of radioactivity locked up in the uranium metal fuel elements. The prevention of hazard from these large quantities of radioactivity depends on the application of technological developments that have been made as the work has proceeded. Radioactivity hazards can be kept under satisfactory control, but this has been achieved only by a great expenditure of money and manpower. There should be no fundamental difficulty in continuing the present satisfactory record into the future and in keeping at a predetermined level the gonad dose to the population from this development, but it will be necessary to continue to expend large amounts of money and effort on the engineering and design aspects of radiation safety.

The Hazards from the Increasing Use of Ionizing Radiations: A Symposium: II. The Dose to Operator and Patient in X-Ray Diagnostic Procedures. G. M. Ardan. Brit. J. Radiol. 29:266-269 (May) 1956 [London, England].

The maximum permissible dose of ionizing radiation is one that falls short of causing appreciable bodily injury to a person at any time during his life. In the eyes, blood-forming organs, and gonads, the suggested permissible dose is 0.3 r per week (16 r per year). As far as the gonads are concerned, this figure only applies to those exposed to radiation in the course of their occupation. The number of patients exposed to diagnostic x-ray procedures is constantly increasing. If one accepts the age of 30 to 35 years as the age by which most people have produced the majority of their children, then we need take this population into account only when considering the genetic aspects. Certainly more than 10% of them will have been radiographed by this age. It is suggested that for large populations the dose should be reduced to 0.03 r per week, and large populations should be considered as not more than 10% of the total population. A radiation worker may receive a body or gonad dose of 480 r in 30 years (the maximum permissible dose of 0.3 r per week) without noticing any ill effects during his lifetime (though this dose may approach or reach the level at which the incidence of leukemia rises above that in the general public). The patient may on the average receive 48 r to the gonads in the first 30 to 35 years of life if only 10% of the population receives this dose. Presumably if the entire population is at risk, the average individual dose must be reduced to 4.8 r during the first 30 to 35 years of life. The higher dose allowed to radiation workers depends on the genetic dilution afforded by the unirradiated public.

If existing knowledge is applied, the patient and staff dose levels may all be kept within reasonable limits, but "all ranks" must be dose conscious. Many small doses add up to a large one. Radiographers should be encouraged to tighten up all precautions, and if it is desirable to reduce radiation dose still further, cooperation must be sought from clinicians in reducing the number of examinations. Unless dose levels can be kept low, it may become necessary to "chart" the patient's dose from the cradle to the grave. There are other sources of radiation to be taken into account. These are increasing, and we must allow them a share of the "body burden."

The Hazards from the Increasing Use of Ionizing Radiations: A Symposium: III. An Attempt to Assess the Genetic Changes Resulting from the Irradiation of Human Populations. A. Howard. Brit. J. Radiol. 29:270-273 (May) 1956 [London, England].

Two questions have to be dealt with in considering the genetic changes that will be produced by the irradiation of human populations: How many mutations will be produced by a given dose of radiation? What effect will such mutated genes have? We cannot answer either question precisely. In attempting to estimate the genetic consequences of radiation we have at best only approximate values to put into our equations. Yet the qualitative truth of these equations is undeniable. The damage may be described as a risk if we are thinking only of the children or grandchildren of an exposed individual or a small group of them; but it is a certainty when we consider the results of an exposure, however limited, in terms of future generations of the community and the species as a whole. There is no "safe" genetic dose. The amount of radiation from artificial sources to which the average person is now exposed in Great Britain will increase the natural mutation rate by a small fraction only. The effects of the new mutations will not be measurable, but they are expected, if artificial radiation continues at its present rate for a generation, to lead to premature death or sterility of a few hundreds or possibly thousands of persons in the next generation alone and to comparable numbers in later generations for hundreds of years. Meanwhile, a much larger section of the population will be living at an additional slight disadvantage. No satisfactory means of curing or alleviating the damage appears to be in sight. Efforts should be made to keep the radiation dose to the gonads as low as possible.

BOOK REVIEWS

Hypertension: A Manual for Patients with High Blood Pressure. By Irvine H. Page, A.B., M.D., Director, Research Division, Cleveland Clinic Foundation. Second edition. Cloth. $3. Pp. 109, with 8 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1956.

The second edition of this highly readable book for the patient with hypertension and for other laymen interested in hypertension upholds the high standard of scientific accuracy of the first edition. The need filled by the latter was evidenced by six printings over a period of eight years. The author wisely points out that no book can replace the warmth, understanding, and counsel of the physician. With exceptional clarity, the book accomplishes the three tasks that the author sets for himself, namely, to explain what hypertension is, to explain the purposes of the various examinations given patients with hypertension, and to give the reason for procedures employed in the management of hypertension. Patient confidence should not be reduced, but enhanced, by the controlled frankness with which the author evaluates the shortcomings of our knowledge of the pathogenesis and treatment of hypertension. There is a lucid discussion of arteriosclerosis and its relation to hypertension. The book closes appropriately with a brief chapter on research and its importance for the ultimate solution of the problem of cardiovascular disease. The reading of this book by patients with hypertension may well be regarded as part of the regimen prescribed by physicians.

Social Security—Fact and Fancy. By Dillard Stokes. Cloth. $4. Pp. 208. Henry Regnery Co., 20 W. Jackson Blvd., Chicago 4, 1956.

Mr. Stokes opposes social security as it exists today because there are insufficient funds to pay its promised benefits and because it is unjust. Those who are eligible for and need its benefits are often deprived of them, while those who are financially secure may receive abundant benefits. The author first explains how these corruptions in the system came about. Social security originated in 1935 from a need on the part of many to have a small income during their years of retirement. At the beginning, the system was reasonably adequate. Most persons, particularly younger workers, would receive annuities paid for largely by their own and their employer's contributions. The contributions were to begin at 2% of wages up to $3,000 per year; half of the contribution would be paid for by the employee and half by the employer. The percentage was to be gradually increased until 1949, when the levy would reach a total of 6%—3% each from employee and employer. The original provisions, however, contained flaws that eventually led to serious defects in the workings of the system. The lower-paid workers received proportionately higher benefits than workers whose incomes were greater. Although this unfairness was not great, it formed the basis for the charity provisions that later were to dominate the system. The original bill also allowed Congress to alter the act, and eventually many who had contributed were deprived of any benefits.

In 1937 the Supreme Court began to suspect that social security was competing with private insurance companies in the savings-investment-annuity business. The Social Security Administration allayed the court's fear by describing its system as one providing charity for the destitute aged; but the public, partly because it enjoys the feeling of independence and self-sufficiency and partly because this theory was a fiction in 1937, was not widely informed of the new philosophy. The public thought, and is still led to think, that the system is one of insurance. In 1939 Old Age and Survivors Insurance (OASI) took the form that it has kept to the present. Redistribution of income came into effect, and the insurance concept vanished in fact, as it had vanished in theory before the Supreme Court in 1937. People were no longer self-sufficient under the system. The money they were to receive after age 65 might be more or less than the amount they and their employer had set aside over a period of years. Because social security is no longer an insurance but a form of charity available to all economic groups, because it assumes that more of the aged are indigent than actually are, and because the redistribution of income (which had its basis in 1935 when the lower paid received proportionately the largest benefits) is effected in a disorderly and illogical manner, many ridiculous situations have arisen. It often happens that the poor pay the "pensions" of the wealthy. In other cases, a damper is put on the incentives of the employed and the semiretired. Sometimes a man over 65 will have enough money on which to live by working 10 hours a week; OASI benefits make up the difference between his income and his cost of living. The same man would be unable to make ends meet by working 30 hours a week, because then he would be deprived of social security.

Also in 1939 the promised benefits began to increase and could not be paid for indefinitely out of the total contributions. The reserve fund in 1955 contained about 22 billion dollars and collected interest at 2¾%. It is estimated conservatively that benefits payable to all those covered in 1955 would be 267 thousand billion dollars. This small and inadequate reserve fund, Mr. Stokes believes, exists on paper only. It is in a trust consisting of federal bonds. These bonds are held by the Treasury Department and have never been sold. The trust fund, a dependent of the government, has only a claim on the Treasury, an agent of the government. It has a claim to its own and only to its own wealth. If the OASI outlay for a year were greater than the funds allowed by Congress, money to pay the benefits would need to be borrowed or raised through increased taxes. The OASI defenders claim that the system is not financially unstable because it is compulsory and perpetual. Mr. Stokes contends that, although compulsory and presumably perpetual, the system is unstable and will end in one of two disasters: it will go bankrupt, or it will produce a great drain on the income of future generations. If, in the year 2000, OASI benefits were paid on their present promised basis, four persons, perhaps in their youth, would have to be taxed to pay the benefits of one, perhaps a retired person with means; and these four persons would have to be taxed a higher percentage of earnings than is our generation. "The promised benefits will not, and cannot, come out of any reserve. If they are paid, the money will have to come out of the earnings of children now in school, of children not yet born." The author cannot predict whether it will be possible in the future to pay the promised benefits out of increased contributions, or whether, even with increased contributions, OASI will lack sufficient funds and collapse.

Mr. Stokes concludes by setting forth a new social security system, free of the shortcomings that have become a part of the present system. The plan would be voluntary. The tax would be 8% of the person's income, and the Treasury Department would issue social security bonds to each subscriber in the amount of of tax that he and his employer paid. The benefits to each person would not exceed the total contributions of the person and of his employer. Benefits would consequently be small, and those who actually need relief would receive it from another source. The author conditions the success of the plan on the maintenance of a balanced budget and stabilized public debt, without which there would be inflation and the bonds when cashed would be worth less than when purchased. It is unfortunate that Mr. Stokes did not consider the alternative of a step rate tax plan geared to attained age, so that those closer to age 65 would be required to pay a higher tax rate than younger workers. Such an alternative would seem more likely to interest the electorate and would serve to point out the exploitation of the young as effectively as his proposal.

The Treatment of Renal Failure: Therapeutic Principles in the Management of Acute and Chronic Uremia. By John P. Merrill, M.D., Associate in Medicine, Harvard Medical School, Boston. Cloth. $6.75. Pp. 238, with 31 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W.C.1, England, 1955.

This short monograph was written "to serve as a guide to the treatment of renal insufficiency and renal failure." The two largest sections deal with the diagnosis, prognosis, and conservative clinical management of acute and chronic renal failure respectively. The approach is quite properly physiological and mechanistic. These sections are preceded by chapters concerning the elements of normal renal function, abnormal renal function, body fluid physiology, and the signs and symptoms of renal failure. These are brief and will be easily comprehensible even

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

to those not chemically minded. The remaining chapters are devoted to a discussion of the treatment of renal failure by extrarenal routes, with special emphasis on dialytic methods (the so-called artificial kidney). The appendix consists of a short exposition of the technique of short-term transperitoneal dialysis, a brief discussion of the management of a dehydrated patient with incipient renal failure, a short table of the potassium content of a dozen common beverages, and a menu for a low-protein, salt-restricted diet.

The bibliography consists of 302 citations of the experimental, clinical, and didactic literature. There is a short but carefully compiled index. The pages are of convenient size and printed in legible type. There is adequate, but not excessive, use of such devices as subtitles and paragraph headings. Most of the line diagrams add to the value of the text, but several of the graphs have been reduced so much as to impair easy legibility. The legends under some of the figures are unduly long, occasionally running to a page or more of fine print. This is a useful and informative textbook. The physiological principles incorporate the most recent contributions from the laboratory, and the clinical section is complete in content and sound in tenet. The citations of the literature, while adequate, tend in some places to be a little uneven. Overabundant documentation of the obvious is occasionally mingled with an unsupported statement of provocative interest. For the most part, however, balance is maintained.

It is unfortunate that some of the value of this monograph is dissipated by the somewhat labored style in which it is written. While the train of thought, for the most part, is easy to follow, it is obscured in places by an imprecise selection of words and circuitous phraseology. A further obstacle to the enjoyment of the text is the liberal use of medical clichés. In these respects, the book is not up to the standard of Dr. Merrill's monograph on acute renal failure (*Medicine* **32**: 215 [May] 1953) or of the current work of Strauss and Raisz (Clinical Management of Renal Failure, Springfield, Ill., Charles C Thomas, Publisher, 1956). Although the author has carefully attempted to maintain an attitude of conservative objectivity in the evaluation of extracorporeal dialysis, he has overemphasized the importance of such procedures. Aside from these minor drawbacks, this book can be recommended to all physicians and surgeons who have occasion to deal with patients with renal insufficiency.

Handbook of Physical Therapy. By Robert Shestack, Ph.G.R.P., P.T.R., Technical Director, Department of Physical Therapy, Washington County Hospital, Hagerstown, Md. Foreword by I. William Nachlas, M.D. Cloth. $4.25. Pp. 212, with illustrations. Springer Publishing Co., Inc., 44 E. 23rd St., New York 10, 1956.

This book is not to be confused with the original "Handbook on Physical Therapy," edited by the Council on Physical Therapy (no longer extant) in 1936 and published by the American Medical Association. Although this book is written by a physical therapist, it has the blessing of physicians and surgeons who are proficient in their respective fields. Written for anyone interested in physical medicine, it is primarily intended for physical therapy technicians and as a ready reference for nurses in hospitals, in clinics, and in physicians' offices. The author advises the technicians and nurses to be guided by physicians' directions and to follow carefully the prescription of the physician in charge of the patient. In general, it is conservatively written, and the bibliography and source material are good. There are, however, controversial features. Some of the therapeutic suggestions mentioned will probably provoke discussion, since authorities differ. For example, under therapeutic uses for galvanic currents there are listed adhesions, backache, strain, fatigue, bruises, bursitis, chronic and acute ankle strain, ankle edema, neuritis, paralysis, scar tissue, and synovitis of the knee or ankle. With the possible exception of scar tissue (and here again opinions differ), it is doubtful that the specialists in physical medicine will agree that the physical agent in question is indicated. The index seems ample. This book is a ready reference on the subject of physical therapy for technicians, nurses, and practitioners.

Scalpel: Men Who Made Surgery. By Agatha Young. Cloth. $5. Pp. 311, with 26 illustrations. Random House, 457 Madison Ave., New York 22, 1956.

This book for the layman or professional man interested in the history of surgery tells its story through the lives of the men who have brought about advances in surgical knowledge. Its four parts deal with the control of hemorrhage, the control of pain, the control of infection, and the control of shock. The author's style makes for easy reading, and among the many whose lives are described are Ambroise Paré; William Harvey; Crawford W. Long, who experimented with ether as an anesthetic; Wells and Morton, who introduced nitrous oxide; Joseph Lister; William Halsted; and Harvey Cushing. The illustrations are few but well chosen. There is a bibliography and an index.

Clinical Recognition and Management of Disturbances of Body Fluids. By John H. Bland, M.D., Associate Professor of Medicine, University of Vermont College of Medicine, Burlington. Second edition. Cloth. $11.50. Pp. 522, with 109 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1956.

This second edition, with a new title, has accomplished its main objective of "providing a practical pathophysiologic interpretation of metabolic deviations of water, electrolyte and hydrogen ion metabolism in all disease states for clinical utilization at the bedside." The first three chapters reflect a mastery of simplification without loss of essentials in presenting the necessary physiological and biochemical facts on which an understanding of the clinical disturbances of metabolism depend. A clinical approach to such disease states as acidosis, alkalosis, cirrhosis, adrenal cortical insufficiency, and heat exhaustion is emphasized, and the pathophysiological bases behind them are cleverly and painlessly reviewed. Fortunately, detailed, practical therapy is included. A refreshing, up-to-date review of the adrenal cortical steroids comprises one chapter. This book should prove of great value to the general practitioner and the internist. The pediatrician and the general and specialized surgeon may also read it with profit, since chapters are devoted to their particular domains. Because of the clear, complete, and interesting presentation of a difficult but important subject and the wealth of clinical application and practical therapy, this book belongs in every student's and practitioner's library.

Adrenal Function in Infants and Children: A Symposium. Edited by Lytt I. Gardner, M.D., Associate Professor, Department of Pediatrics, State University of New York, College of Medicine, Syracuse, N. Y. Cloth. $6.75. Pp. 221, with illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W.C.1, England, 1956.

This symposium consists of contributions by 18 leading authorities and includes an anatomic discussion, with particular reference to infants and children, of the histophysiology of the adrenal cortex, the hormonal levels in maternal and cord plasma, chromatography, and the response of infants to corticotropin and steroid metabolism. Of particular interest to the practicing pediatrician will be the round-table discussion on the therapy of hyperadrenalcorticolism conducted by Lawson Wilkins. A description of the Barr skin biopsy test for determining the chromosomal sex is appended to the book. The book is well printed and adequately illustrated. As is probably inevitable in such a symposium, emphasis on the contributors' own work results in a somewhat disjointed account of the subject instead of a unified presentation, as in a monograph by a single author. The book will, accordingly, be of primary interest to those actively engaged in research or treatment of congenital adrenal disorders.

A Pictorial History of Medicine. By Otto L. Bettmann, Ph.D., Founder and Director of Bettmann Archive, New York City. With foreword by Philip S. Hench, M.D. Cloth. $9.50. Pp. 318, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, Canada, 1956.

This history of medicine relies heavily on pictures to tell its story—in fact, no page is without at least one illustration and most pages have several. The author has also supplied an unobtrusive text. Beginning with practices common in ancient Egypt, the author proceeds through those of the ancient Greeks and Romans and those of medieval Europe to those of modern times. Ancient quackeries are depicted as well as practices that have contributed to modern medical science. In the excellent foreword, Dr. Philip Hench emphasizes the priceless heritage of which the modern physician may avail himself at a cost of only the time necessary to study the works of the old masters. The illustrations are well chosen. Most of the old favorites and many not so well known are here. The book should appeal to the medical man and to that portion of the general public that is interested in this phase of the history of mankind. There is a bibliography and an index.

QUERIES AND MINOR NOTES

TEST FOR PHYSICAL FITNESS

To the Editor:—*Some public school systems have started to test their students for physical fitness by the use of the Kraus-Weber test, which tests various muscle groups. According to this criterion, the children living in the various areas of the United States show an extremely high percentage of failures as compared to children of similar ages in similar communities in Europe; namely, Switzerland and Northern Italy and Austria. Does the Kraus-Weber test provide relevant information on one aspect of physical fitness? Is the sampling done in this test relevant to the question of total physical fitness? I assume that the groups tested are free of serious organic disease.*

M.D., New Jersey.

Answer.—The so-called Kraus-Weber test and its use in some schools has evoked considerable controversy. Also, in discussion and description of the tests, there has been confusion of the terms health and fitness. This resulted in part from the title of an early article on the test, "Muscular Fitness and Health" (*J. Health, Phys. Ed. & Recreat.* **24**:17, 1953), and the inference that the tests were indirectly a measure of health. Today's youth may live a more sedentary life, but by every solid measure they are healthier than any previous generation. Children born today have a far longer life expectancy. Many more of them live to enter school. A greater proportion survive the school years. On the average they are taller and heavier than their forebears. Diseases that used to maim and kill them have been largely brought under control. Any discussion of fitness inevitably raises this question: Fitness for what? If the best answer is fitness for living, a broad definition of fitness becomes essential. The concept of the integrated individual demands consideration of mental-emotional as well as physical constituents. These would include *(a)* optimum organic health, *(b)* appropriate adjustment to irremediable defects, *(c)* ability to perform daily duties without physical or mental depletion, *(d)* a state of mind that permits full and satisfactory living, and *(e)* the capacity to meet stress and emergency situations successfully. The Kraus-Weber test, originally used as one phase of diagnosis of muscularly deficient backs, according to its authors, consists of "simple tests for trunk muscle strength and flexibility." Some of its advocates have interpreted it to measure fitness in a broad sense, and even to determine health status. Obviously, test movements related largely to the trunk muscles can directly appraise only limited aspects of total muscular fitness. They do not cover, for example, arm and shoulder girdle strength that might be tested by activities such as the push-up or chinning. Nor do they include checking of speed or agility by events such as a shuttle or dodging run. While there may be a correlation, it would require a broader battery of tests to appraise over-all strength, agility, speed, and coordination—all parts of muscular fitness.

Whether the Kraus-Weber test measures the aspects of muscular fitness it purports to measure has been questioned on several grounds: 1. One of the test movements, "having the patient try to touch the floor with the tips of his fingers, knees kept straight" may be as much a test of relative length of body parts as of flexibility (Fox, M. G., and Atwood, J.: *J. Health, Phys. Ed. & Recreat.* **26**:21, 1955). Checking the correlation of sitting height and ability to perform this test movement could be most revealing. 2. Since the test movements are more indigenous to European types of physical training than to the emerging freer American physical education, the comparative results may be chiefly a reflection of differing programs (Lawther, J. D.: *J. Health, Phys. Ed. & Recreat.* **27**:23, 1956). Testing European and American children in events such as base running for speed would probably show as much superiority for American children as was demonstrated by European children in the gymnastic movements. 3. Little or no relationship has been found between scores on the Kraus-Weber test and scores on other motor ability and strength tests in comparative studies. For example, there was no relationship between results obtained with the Kraus-Weber and the grip-strength test, which has been found by many researches to have a high relationship to general body strength (Phillips, M.: *J. Health, Phys. Ed. & Recreat.* **26**:14, 1955). While the subject of the Kraus-Weber test is and will probably remain controversial for some time, there is little doubt that the accompanying publicity on fitness in both public and professional press will have beneficial results. Already it has caused us to reexamine and clarify our definitions of health and fitness. It has led school personnel and patrons as well as physicians to look critically at present school health and physical education programs. The broad program needed for fitness has been agreed on by medical, education, and public health representatives (Suggested School Health Policies, ed. 3, Chicago, American Medical Association, 1956). Now it remains to apply their recommendations in all our schools and communities.

CONFESSIONS OF AN OPIUM EATER

To the Editor:—*In Thomas De Quincey's "Confessions of an English Opium Eater," he states that he used daily 320 grains of opium, which was equal to probably 8,000 drops of laudanum a day. Three hundred twenty grains of opium, in about 1840, would be the total of how much morphine today? Was a grain of opium then the same as a grain of opium today?*

H. D. Murdock, M.D., Tulsa, Okla.

Answer.—The morphine content of crude opium varies greatly, extremes of 6 to 23% morphine content being reported. The average morphine content of opium is about 10%. Since the methods of harvesting and preparing crude opium have not changed greatly over the years, one might be safe in assuming that De Quincey's morphine intake was about 32 grains per day. Ingestion of this amount of morphine is possible due to the development of tolerance and very likely would not be unusual in addicts under conditions of unlimited supplies of drugs. During De Quincey's time there was no means of standardizing the morphine content of opium, so his daily morphine intake might have varied greatly. Today official opium preparations are standardized to contain 10% of morphine. Variability in morphine content would represent the chief difference between a grain of opium in De Quincey's time and a grain of opium today.

LEG ULCERS IN ARTHRITICS

To the Editor:—*A patient has chronic rheumatoid arthritis that has resulted in almost complete immobilization of all joints. He has undergone all modern methods of therapy with no success. He now has some chronic ulcers on the lateral aspect of the legs that have refused to heal in spite of massive antibiotic therapy. It is impossible to keep him in bed and elevate the limbs because that results in the formation of decubitus ulcers. Would the application of an Unna's paste boot be advisable? Are there any other suggestions to promote healing?*

R. George Wolff, M.D., Homedale, Idaho.

Answer.—Leg ulcers in persons with rheumatoid arthritis are almost always the result of dependency and stasis. It is necessary to rule out arterial insufficiency as an etiological factor. Stasis ulcers will not heal with topical applications alone, but require correction of the stasis. This is possible either by elevation or by elastic support. In this case, if arterial circulation is adequate, a bland dressing on the ulcer with a snugly and evenly applied elastic bandage from toe to knee should

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

ultimately result in healing. An Unna boot would be satisfactory but possibly should be reinforced with an elastic bandage. Skin grafting will accelerate the healing of large defects. Elastic support should be continued after healing as a prophylactic measure.

CARBONATED DRINKS

To the Editor:—*What is the effect of carbonated drinks on the urine? I am particularly interested in any relation to pH of the urine. This subject has arisen in the management of recurring renal calculi.* *M.D., New Jersey.*

Answer.—This question has been discussed with several urologists, who are of the opinion that carbonated drinks have little or no effect on the urine and would have no relationship to recurring renal calculi. Just how much of the carbon dioxide that gets into the stomach with a carbonated drink is actually absorbed into the blood stream is debatable. However, whatever is absorbed could not affect the pH of the blood, because any slight excess of carbon dioxide would be eliminated in the expired air; hence the acidity of the urine would not be affected.

HEMIFACIAL SPASM

To the Editor:—*A woman, aged 58, has an annoying twitching of the right eyelids, which seems also to extend down into the right cheek. It came on suddenly, and, as she felt well otherwise, I thought it was of nervous origin and prescribed small doses of phenobarbital, with no success. An oculist examined her eyes but found nothing that he thought causative; there is good vision corrected with glasses and no nystagmus. Both pupils react well to light and accommodation. Speech, taste, smell, and hearing, as well as appetite, have all been normal. There is no neuropathy of facial nerve (Bell's palsy), and the arms and legs are not affected. I then prescribed chlorpromazine, 20 mg. twice a day, for two weeks and later trihexyphenidyl (Artane) for a like period. The past several weeks the patient has received intramuscular injections of 1,000 mcg. of vitamin B_{12}, but all apparently with no success. The tic appears even while she is busy at her housework, and may at times wake her from sleep. I would welcome suggestions as to study and treatment.* *M.D., Pennsylvania.*

Answer.—Although a positive diagnosis cannot be made on the evidence submitted here and it would be most desirable to examine the patient, it seems likely that this woman is suffering from what is known as a hemifacial spasm. Satisfactory treatment of this condition is difficult, but best results have been obtained from partial division of the various branches of the facial nerve in the cheek in the anterior part of the parotid gland. Unfortunately the results of such surgical treatment often are not permanent, and the treatment often has to be repeated at a later date. There is no medication that is known to be effective in this condition. An alcohol injection is even less satisfactory than surgical treatment.

CANCER OF CERVIX

To the Editor:—*What is the opinion of experts concerning the treatment of cancer of the cervix that has apparently been cured locally by radium and x-ray? I am interested in knowing whether surgical excision of the iliac nodes is advisable, especially if the original lesion is apparently confined to one side of the cervix.* *M.D., Kentucky.*

Answer.—There is no unanimity of opinion relative to the treatment of carcinoma of the cervix. Schmitz and his followers (*Am. J. Obst. & Gynec.* **49**:19, 1945), Graham (*Am. J. Obst.* primary therapy and employ radical hysterectomy and pelvic lymphadenectomy when they have proof that the disease has recurred or persisted. Smear studies and biopsy are used as adjuncts to palpation and visualization to determine these facts. Carter and associates (*South. M. J.* **41**:895, 1948) followed irradiation therapy with hysterectomy and lymphadenectomy when the erythema had subsided. The incidence of complications, however, was too great to justify this as a routine procedure after irradiation. Meigs (*Am. J. Roentgenol.* **57**:679, 1947), on the other hand, uses radical hysterectomy and pelvic lymphadenectomy as the primary treatment of stage 1 and 2 carcinoma of the cervix. Studies by Morton (*Am. J. Obst. & Gynec.* **49**:19, 1945), Graham (*Am. J. Obst. & Gynec.* **64**:402, 1952), and others have refuted the theory of radioresistance of all tumor in lymph nodes. Therefore, a majority of workers in the field withhold routine surgical procedures after irradiation and resort to this therapy when findings indicate radioresistance of the disease.

FOODS THAT COLOR THE URINE

To the Editor:—*Are there any foodstuffs or condiments that would give the urine a reddish color suggestive of hemoglobinuria?* *M.D., New Jersey.*

Answer.—Beets, rhubarb, and certain dyes can sometimes impart to urine a color that suggests hemoglobinuria or hematuria. Hard candies colored with fuchsin and other dyes have caused urine to turn red or purple. The reddish-brown coloration of urine that often appears after rhubarb is eaten is identical to that which appears after the use of senna, a purgative, and cascara, a laxative drug. Phenolphthalein, also used as a laxative, gives urine a magenta color. In the incidence of reddish urine it should be remembered that certain drugs taken orally may sometimes cause actual hematuria. It is stated in "French's Index of Differential Diagnosis" (edited by A. H. Douthwaite, ed. 7, Baltimore, Williams and Wilkins Company, 1954, p. 343) that "in the treatment of disease by turpentine, hexamine, etc., blood is passed in the urine, and cases have been recorded in which hematuria occurred during treatment with sulfonamides."

METAL CLEANING IN RAILROAD SHOP

To the Editor:—*In some railroad shops the metal repair parts are thrown into large vats containing chlorinated hydrocarbons with phenolic bodies where they are cleaned and then taken out of the vat and rinsed with live steam, which makes these substances more volatile. What pathology can be brought about by the continuous exposure to this over a period of years? What precautions should be taken? In regard to the chlorine in the chlorinated hydrocarbons, what injury to the tissues can it cause?* *M.D., Michigan.*

Answer.—This query fails to mention any particular chlorinated hydrocarbon or phenolic in use. The toxicity within the several members of the respective groups varies. This reply deals only with prototypes, and if the chemicals assumed are not the ones in actual use this reply becomes inapplicable. The chlorinated hydrocarbon most likely to be employed in metal cleaning is trichloroethylene. This toxic substance as its initial action may serve as a central nervous system excitant, producing a state resembling early ethyl alcohol effects. This stage may be followed by narcotic action. In fact, trichloroethylene is a somewhat widely used general anesthetic. Otherwise, trichloroethylene may prove damaging to the respiratory and cardiac systems, leading to early deaths from respiratory failure. Severe damage to the kidneys and liver is not the rule but is not exceptional. Dermatitis is commonplace. Chronic poisoning may be doubted. The maximum acceptable concentration for continued work is 200 ppm, from which it appears that this substance is of a lower order of toxicity than carbon tetrachloride. The phenolic likely to be utilized in metal cleaning is one or more of the cresols. The toxicity of cresols is that of phenol. Although the vapors of phenolic may lead to systemic impairment, greater threat arises from skin contact, those agents readily passing the skin barrier causing systemic disorder, although profound surface damage may appear. Whatever be the mode of entry, extensive exposure promptly leads to collapse and impaired respiratory function. If the exposure is less severe, the kidneys may be involved in nephritis, in which suppressed urine may be a feature along with damage to the liver and other vital organs. In the present instance the apparent need is for a more exact examination as to the materials and extent of exposure, both to the chlorinated hydrocarbons and to the phenolics. Since these circumstances are uncertain, it may be well to solicit the guidance of the Michigan State Department of Health, which agency is qualified to make appropriate examination and recommendation.

PINK LESION ON LIP

To the Editor:—*A man, aged 42, suffers from a faintly pink, sharply demarcated, slightly elevated lesion running along in a wavy but definite line at the vermilion border of the upper lip. It suggests granuloma annulare or lupus erythematosus. Suggestions as to diagnosis would be appreciated.*

M.D., Massachusetts.

Answer.—On the basis of the description given, it is impossible to make any intelligent suggestion as to the exact disease that this lesion represents. Apparently it is a dry, raised lesion and not suggestive of any eczematous or dermatitic process. In general, the entire gamut of "granulomas" must be considered here. It is assumed that the medical and laboratory studies of this patient yield no evidence of systemic disease, in particular syphilis, sarcoid, disseminated lupus erythematosus, tuberculosis, or deep fungous infection. It seems probable that the crucial examination to make in this patient is a biopsy. The tissue taken need not be a large wedge to yield adequate information. If the chief site of involvement is the vermilion border, a small wedge of tissue may be taken and the incision sutured with hardly any detectable scar. If the lesion is principally above the vermilion border, a small (3 mm.) punch biopsy specimen may be taken with a scar no greater than that resulting from a small chickenpox lesion. It is important that such a biopsy specimen be taken down to the subcutaneous tissue. If an excision is done from normal skin into the vermilion border, care must be taken in suturing the lesion to avoid conspicuous irregularity. In the field of tumors or granulomas representing systemic disease, the expert general pathologist will be capable of a well-informed opinion on the biopsy. In the case of some less common conditions that are often entirely mucocutaneous, the help of a dermatopathologist may be needed, because this is a rather highly specialized field.

TRANSFUSION WITH BLOOD OF MALARIAL DONORS

To the Editor:—*There is some discussion in the California blood bank system about letting down the bars somewhat regarding the use of blood of a person who has had malaria without a recurrence in two years. Our bank does not use such blood for replacement, only for plasma. It is my belief that any restrictions thus far placed on reputed malarial risks are based on clinical experience; e. g., recurrence after many years, without reinfection. I also feel that any contemplated relaxation in these restrictions is likewise based only on clinical experience. I do not consider this evidence sufficient to make a change in our program of excluding these risks for replacement.*

M.D., California.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—There is a small risk of transmission of malaria by blood transfusion. Methods are not available to laboratories to estimate the possibility of the transmission of this disease. Instances of malaria following blood transfusion from donors who have had malaria more than 30 years previously have been reported. In one experience the donor himself was not known to have ever had clinical symptoms of the disease. In this latter case the transfused infection was due to Plasmodium malariae. It is recommended (Technical Methods and Procedures of the American Association of Blood Banks, Minneapolis, Burgess Publishing Co., 1953) that individuals who have a history of malaria not be accepted as donors except for blood to be processed to plasma. Individuals living in malarious areas who have taken suppressive therapy may be accepted as blood donors provided that two years have elapsed since discontinuance of suppressive therapy. It is recognized that emergency situations and certain local conditions might require relaxing these requirements at the discretion of the physician. Individuals who have had malaria in the past or individuals living in malarious areas may be accepted as blood donors provided the risk is known to the physician. Should transmission of malaria occur, prompt antimalarial treatment can be given the patient. It would be reasonable to suppose that the number of individuals who might give a history of malaria in the state of California would be relatively small and that there would be little need to relax the standards presently in use in that area. The transmission of malaria in the United States by blood transfusion is believed to be an extremely rare occurrence. However, when it does take place the examining physician in a blood bank is usually most anxious to reinstitute the more firm application of restrictive donor requirements and reject as donors those persons with a history of malaria or long residence in a malarious area.

Answer.—In November, 1953, the committee on medicine and surgery of the National Research Council accepted the recommendation of its subcommittees that donors with a history of malaria or intensive suppressive therapy who had not had a clinical attack in the preceding two years might be accepted as donors of whole blood for transfusion. The National Institutes of Health has accepted this recommendation as the minimum period that may be used in accepting such donors for blood banks licensed under the biologics control provisions of the Public Health Service Act. Donors who have had no clinical attack of malaria in the preceding six months may be accepted for donations to be used as plasma or plasma fractions. In the latter case, the bottle and donor card should be stamped "For Fractionation Only." In April, 1956, the National Research Council reaffirmed the the above statement, but made an additional recommendation for overseas bleeding centers as follows: "For bleeding centers in endemic malaria areas outside the continental U. S. donors who have had a history of malaria may be accepted for donations who have had no clinical attack of malaria during the past two years, whether or not they have been on suppressive therapy."

REACTION FOLLOWING USE OF TRIPLE VACCINE

To the Editor:—*I should like to comment on the consultant's reply in the Query and Minor Note with the above title in* The Journal, *March 17, 1956, page 1004. A safer procedure to follow in a child who has had fever and irritability following an injection of diptheria and tetanus toxoids with pertussis vaccine would be to give each of the antigens separately and, even more important, to reduce the dose. Thus the first dose would be 0.1 cc. followed in five to seven days, if there were no adverse effects, with 0.2 cc. and five days later with 0.2 cc. again. When the mother reports fever and irritability of a severe degree after injection of triple vaccine I give 0.1 cc. of the slower absorbed preparation. This is followed by 0.2 cc. for two doses separated by a five-day interval. In this way there have been no adverse effects. Another method that has been quite successful is the intradermal one. A poll of 58 physicians in the United States and Canada by me (Reactions from DPT Immunization and Its Relationship to Allergic Children, J. Pediat. 47:60-67 [July] 1955) brought to light 15 cases of convulsions following use of the more slowly absorbed preparation during the period between 1949 and 1955. Not one of the children having a convulsion was allergic. Convulsions have been noted with fluid triple vaccine as well as with other vaccines. The exact mechanism is still poorly understood. Faber and Miller (*Pediatrics *1:579-580 [April] 1948) have offered several hypotheses, among which is the allergic one. However, it does not seem to me at this time that one could state unequivocally that fever and irritability following administration of triple vaccine is an allergic reaction.*

Salmon R. Halpern, M.D.
3534 Maple Ave.
Dallas, Texas.

EXCESSIVE COFFEE DRINKING

To the Editor:—*In the answer to and comment on "Does drinking 20 to 30 cups of coffee daily definitely cause any harmful effects?" in* The Journal, *March 19, 1955 page 1069, and May 5, 1956 page 119, some valuable points were stressed; but another important feature is that such an amount of coffee would mask tiredness, which after all is a physiological response to stress and strain. In the early stages such an effect may not be revealed by electrocardiographic or other findings. In fact, the body may respond with a certain amount of compensation to the large intake of coffee, but the constant suppression of physiological fatigue will finally manifest itself in premature exhaustion with its various clinical consequences.*

Alfons Salinger, M.D.
2212 Calumet Dr.
Houston 4, Texas.